Fiscal Year 2011 Site Sustainability Plan

LOS ALAMOS NATIONAL LABORATORY

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Abbreviations and Acronyms

ASM	Acquisition Services Management
ASM-AO	Acquisition Services Management – Assurance Operations
ASM-PM	Acquisition Services Management – Property Management
BOA	Basic Order Agreement
BOD	Biochemical Oxygen Demand
BTFLP	Beryllium Test Facility Laundry Project
CCF	Central Computing Facility
CEM	Certified Energy Manager
CMR	Chemistry and Metallurgy Research
COC	Cycles of Concentration
CT	Cooling Tower
CRAC	Computer Room Air Conditioners
COGEN	Co-generation plant
DARHT	Dual Axis Radiographic Hydrodynamic Test facility
D&D	Decontamination and Decommissioning
DES	Detailed Energy Survey
DOE	Department of Energy
DO	Delivery Order
DPR	Designated Procurement Representative
ECA	Electric Coordination Agreement
ECM	Energy Conservation Measure
EERE	Energy Efficiency and Renewable Energy
EMS	Environmental Management System
ENV-ES	Environmental Stewardship
EO	Executive Order
EPA	Environmental Protection Agency
EPEAT	Electronic Product Environmental Assessment Tool criteria
ESPC	Energy Savings Performance Contract
FEMP	Federal Energy Management Program
FIMS	Facilities Information Management System
FIRP	Facility and Infrastructure Recapitalization Project
FOD	Facility Operations Director
FY	Fiscal year
GHG	Greenhouse gas
GSAF	Generator Set Aside Funds
GSF	Gross Square Feet
HPC	High Performance Computing Division
HPSB	High Performance and Sustainable Buildings
HVAC	Heating, Ventilation, and Air Conditioning
IP	Infrastructure Planning
LAC	Los Alamos County
LANL	Los Alamos National Laboratory
LANS	Los Alamos National Security, LLC
LANSCE	Los Alamos Neutron Science Center

LASEC	Los Alamos Science & Engineering Complex
LASO	Los Alamos Site Office
LDCC	Laboratory Data Communications Center
MMBTU	Million British Thermal Units
LEED	Leadership in Energy and Environmental Design
NEPA	National Environmental Policy Act
NLDC	National Laboratory Director's Council
NMED	New Mexico Environment Department
NNSA	National Nuclear Security Administration
NPDES	National Pollutant Discharge Elimination System
ORP	Outfall Reduction Program
P2	Pollution Prevention
PPA	Power Purchase Agreement
PUE	Power Use/Utilization Effectiveness
PV	Photovoltaic
RAMP	Roof Asset Management Program
RECs	Renewable Energy Certificates
SCC	Strategic Computing Complex
SERF	Sanitary Effluent Recycle Facility
SWEIS	Site-Wide Environmental Impact Statement
TA	Technical Area
TEAM	Transformational Energy Action Management
TYSP	Ten Year Site Plan
UI	Utilities and Institutional Facilities
UESC	Utility Energy Services Contracts

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1 Executive Summary

1.1 Introduction

Los Alamos National Laboratory's (LANL's) ISO 14001 certified Environmental Management System (EMS) establishes objectives and targets to improve compliance, reduce environmental impacts, increase operational capacity, and meet long term sustainability goals. As part of these objectives, and to meet the goals established in Department of Energy (DOE) Order 430.2B *Departmental Energy, Renewable Energy and Transportation Management* and DOE's *Strategic Sustainability Performance Plan,* LANL prepared the fiscal year (FY) 2011 Site Sustainability Plan. LANL's *Strategic Sustainability Performance Plan* is managed through the Senior Environmental Steering Committee which oversees the EMS and is chaired by Mr. Michael Mallory, the Principal Associate Director for Business & Operations, with membership of several Laboratory Associate Directors. The Energy Management Council was chartered as a subcommittee of the EMS to manage the goals established in DOE Order 430.2B and reports directly to the Senior Environmental Steering Committee.

The challenges presented by the sustainability targets and goals established in Executive Order (EO) 13514 require innovative solutions that draw upon the many resources and talents at the Laboratory. Through these mechanisms, the Laboratory's sustainability planning process is part of our Environmental Management System which engages all directorates at the Laboratory. This Plan follows DOE's *Guidance for FY 2010 DOE Site Sustainability Plans.* The FY 2011 Plan reflects FY 2010 accomplishments and outlines FY 2011 actions that enable LANL to continue progress toward DOE's sustainability goals and reporting requirements.

1.2 Site Energy Management Vision

LANL's EMS established goals and objectives for FY 2011 that addresses LANL's key environmental improvement priorities and significant environmental aspects. Table 1.4.1 provides the crosswalk between LANL's EMS goals and the sustainability goals outlined by the Department of Energy's Strategic Sustainability Performance Plan. In addition, tightening environmental regulatory permit and discharge limits are creating compliance challenges. The Laboratory is taking a strong prevention- based approach to address these issues to limit liability and ensure operational capacity is available to meet mission requirements.

Table 1.4.3 provides a summary of LANL's plans for meeting the requirements and goals of DOE's *Strategic Sustainability Performance Plan.* More specifically, the FY 2011 Site Sustainability Plan and the attached Consolidated Energy Data Report (CEDR) document track the progress against the contractor requirements of DOE Order 430.2B, the Energy Policy Act of 2005 (EPAct 2005), EO 13423, *Strengthening Federal Environmental, Energy, and Transportation Management*, the Energy Independence and Security Act of 2007 and EO 13514, *Federal Leadership in Environmental, Energy, and Economic Performance*. The CEDR contains a consolidated list of the active and proposed energy management projects. The projects in the CEDR contribute to energy reduction, water reduction, and renewable energy goals. Using the CEDR, LANL's

Energy Management Council reviews progress which is reported periodically to the EMS Senior Steering Committee (e.g., project confidence estimates and funding outlooks). The members of the Energy Management Council work toward identifying projects and funding sources that directly contribute to the EMS targets and objectives.

In addition, annual reporting on the EMS is done through the Environmental Management System reporting database hosted on Fed Center. Pollution Prevention, Sustainable Acquisition, annual accomplishment and award nominations and elements of GHG reporting is done through the Pollution Prevention Tracking and Reporting System hosted by DOE.

1.3 Major Planning Assumptions and Energy Issues & Funding Strategies

LANL is depending on the success of a number of projects, including the Energy Savings Performance Contracts (ESPCs), a Steam Plant replacement, the Sanitary Effluent Reclamation Facility (SERF) expansion, High Performance Sustainable Building (HPSB) implementation, lighting retrofits, HVAC/fume hood re-commissioning, building scheduling, and the associated footprint reduction efforts to achieve our energy management goals. Several of these projects are in the conceptual planning phases or not fully funded throughout the planning horizon of this plan (see Table 1.4.4 *Significant Project Design & Implementation Time*). The *Site Sustainability Summary Table* (Table 1.4.3) assumes that these projects will proceed as planned. In addition, the renewable energy projects detailed within this plan depend on the success of our integrated partnerships with other organizations, specifically the Los Alamos County through the Electric Coordination Agreement.

The Pollution Prevention program is developing zero waste or As Low As Reasonably Achievable (ALARA) approach to waste generation as part of the long term sustainability goals. As well, EMS will address the "three legged stool" approach of sustainability by recognizing social and economic aspects of the Laboratory in the local and regional communities. Pollution prevention outreach, compliance functions, and projects are funded through a fee levied on waste that serves as a strategic reinvestment fund for pollution prevention projects.

1.4 Relevant Graphs & Tables

1.4.1 Significant Environmental Aspects – Listing

Air Emissions	Interaction with Wildlife and/or Habitat
Biological Hazards	Radioactive Material Use and Storage
Chemical Use and Storage	Radioactive Waste Generation & Management
Cultural/Historical Resource Disturbance	Resource Use, Reuse, Recycling
Discharge to Wastewater Systems	Solid or Sanitary Waste Generation & Management
Engineered Nanomaterials	Spark or Flame Producing Activities
Hazardous or Mixed Waste Generation & Management	Storage of Hazardous or Radioactive Materials and Wastes in Tanks
Hazardous/Radioactive Material and Waste Packaging & Transportation	Surplus Properties and Materials Management
Interaction with Drinking Water Supplies/ Systems or Groundwater	Visual Resources
Interaction with Soil Resources	Work within or near Floodplains and Wetlands

Interaction with Surface Water and Storm Water	Interaction with Contaminated Sites

1.4.2 EMS and Sustainability Plan Goals Crosswalk

EMS Goal	SSPP Goal
Improve environment and safety compliance performance through improved integration and communication at the work level.	Goal 3: Comprehensive GHG Inventory Goal 6: Water Use Efficiency and Management Goal 7: Pollution Prevention and Waste Elimination Goal 8: Sustainable Acquisition
Reduce cost and increase efficiency and operating capacity through systematic implementation of pollution prevention.	Goal 1: Scope 1 and 2 GHG Reductions Goal 2: Scope 3 GHG Reductions Goal 4: High Performance Sustainable Buildings Goal 7: Pollution Prevention and Waste Elimination Goal 8: Sustainable Acquisition Goal 9: Electronic Stewardship and Data Centers Goal 10: Department Innovation
Reduce cost and increase efficiency and operating capacity through energy conservation and reductions in fuel, electricity, and water consumption.	Goal 1: Scope 1 and 2 GHG Reductions Goal 2: Scope 3 GHG Reductions Goal 4: High Performance Sustainable Buildings Goal 5: Local and Regional Planning Goal 6: Water Use Efficiency and Management Goal 9: Electronic Stewardship and Data Centers Goal 10: Innovation
Enhance workplace environment, safety, and security through implementation of Laboratory-wide cleanout activities to disposition unneeded equipment, materials and chemicals, and waste.	Goal 7: Pollution Prevention and Waste Elimination Goal 9: Electronic Stewardship and Data Centers
Ensure operational capacity through implementation of the NPDES Outfall Reduction Program by 2012.	Goal 6: Water Use Efficiency and Management Goal 1: Scope 1 and 2 GHG Reductions
Reduce long-term impacts, increase operational capacity, and ensure Laboratory sustainability through an integrated approach to site-wide planning and development.	Goal 1: Scope 1 and 2 GHG Reductions Goal 2: Scope 3 GHG Reductions Goal 5: Local and Regional Planning

1.4.3 Site Sustainability Goal Summary Table

DOE Goal	Performance Status	Planned Actions & Key Issues
28% Scope 1 & 2 GHG reduction by FY2020 from a FY2008 baseline (related goals intended below)	LANL reports direct and indirect dioxide, methane emissions, sulfur dioxide, and electricity usage. Currently, Scope 1&2 emissions total 325,044 metric tons CO2 equivalent.	LANL will develop a FY2020 Site Sustainability Plan for meeting the GHG, energy, and water goals.
30% energy intensity reduction by FY 2015 from a FY 2003 baseline and target reduction for FY 2010 is 15%	Between FY 2003 and FY 2010, LANL reduced its cumulative energy intensity by 15%. ESPC I was initiated and additional ECMs have been identified.	ESPC I is in progress and project planning has been initiated to develop a second ESPC, Steam Plant Replacement Project, HPSB implementation, lighting retrofits, HVAC re-commissioning, building setback scheduling, and footprint reduction efforts.
7.5% of a site's annual electricity consumption from on-site renewable sources by FY 2010	31,950 MWhr RECs were purchased in FY 2010, which comprise 7.5% of the total electrical energy use.	LANL will continue to purchase RECs to meet renewable goals as necessary. Working in conjunction with LAC to construct 3MW low flow turbine on Corps of Engineer Dam at Abiquiu which is expected to be online in 2011. Working in conjunction with LAC to develop a 1 MW PV array through a PPA at NNSA landfill site.
Every site to have at least one on-site renewable energy generating system	Currently, LANL has several solar power lighting systems in place. Additionally, Los Alamos Power Pool is proceeding with installation of the Abiquiu Dam low-flow turbine, which will be fully installed in 2011.	LANL is working with the DOE, NNSA and LAC to modify the Electric Coordination Agreement in order to pursue a utility scale PV PPA option.
10% annual increase in fleet alternative fuel consumption relative to a FY 2005 baseline	LANL met this goal for FY 2010. Thirty-six percent of LANL's fleet is capable of using alternative fuels. Unfortunately, not all E-85 capable vehicles use E-85 due to lack of local supply. However, E-85 is being used in protective force vehicles due to an off hours refueling truck.	LANL continues to increase the number of Alternative Fuel Vehicles. In addition, LANL will continue to support initiatives related to the development of alternative fuel infrastructure in Los Alamos County by initiating a Request for Proposal for a local alternative fuel vendor.

2% annual reduction in fleet petroleum consumption relative to a FY 2005 baseline	LANL met this goal for FY 2010. During FY 2009 LANL used 24,575 gallons of E-85 which represents 4% of the total fuel consumption. This 4% of E-85 meets the 2% petroleum reduction requirement.	Continue with mobile on-site fueling of AFV. LANL is estimating that 30,000-50,000 gallons of E-85 (4-8% of the total fuel) will be used in FY10. Also, LANL is focusing on right-sizing the fleet and more efficient vehicles, including hybrids.
75% of new light duty vehicle leases must consist of alternative fuel vehicles (AFV)	LANL met this goal for FY 2010. Fleet management developed a FY 2009 policy that states all new vehicles leases must be AFVs.	Continue to replace vehicles with AFVs.
To the maximum extent practicable: advanced metering for electricity (by October 2012), steam, and natural gas (by October 2016); standard meters for water	LANL has achieved 81% of the EPAct 2005 electric metering goal.	LANL will install meters in 2011 and 2012. LANL is on track to meet the EPAct 2005 metering goal by Oct. 2012 and has drafted an FY 2011 Metering Plan that addresses plans for natural gas, water, and steam metering.
Cool roofs, unless uneconomical, for roof replacements unless project already has CD-2 approval. New roofs must have thermal resistance of at least R-30	LANL met this goal for FY 2010. LANL under the Roof Assessment Management Program (RAMP) program has been installing cool roofs for the last 3 years. Most current projects are CMR (145,000 sf), 55-0114 (8,000 sf), 03-0132 (11,000 sf), and 03-0039 (155,000 sf) in FY09.	LANL RAMP will continue to install cool roofs for the duration of RAMP (ends in 2013). LANL RAMP is in full compliance with Secretary Chu's Cool Roofs requirement.
Training and outreach. DOE facility energy mangers to be Certified Energy Managers by September 2012	30 Sustainability/Energy-related training days were completed in FY 2010. In FY 2010, Outreach included an Energy Town Hall with presentations open to the public. Currently, one Utilities & Institutional Facilities (UI) staff member is a Certified Energy Manager (CEM).	Additional CEM training and Facility Manager training is expected in FY 2011. Outreach plans for FY 2011 include building tenant awareness and creating Green Teams for specific buildings. CEM training will occur for one additional staff member in FY 2011.
Sulfur hexafluoride (SF6) capture program by September 2012	According to our FY 2008 emissions, SF6 represents approximately 5% of our Scope 1 & 2 emissions.	LANL will perform a pollution prevention opportunity assessment to determine the appropriate reduction efforts.

10% Scope 3 GHG reduction by FY 2020 from a FY 2008 baseline	Recent investigation revealed that employee commuting comprises the majority of LANL's Scope 3 GHG emissions, which is 73,821 metric tons CO2 equivalent.	LANL is planning to implement an employee incentive program to reduce employee commuting and increase webinars and virtual meetings.
All new construction and major renovations greater than $5 million to be LEED® Gold certified. Meet High Performance and Sustainable Building (HPSB) Guiding Principles if less than or equal to $5 million	CMRR/RLUOB is in construction phase and is anticipated to achieve at least LEED Silver as the first LANL facility to achieve LEED certification. Projects in design and conceptual design phases are incorporating LEED Gold into project requirements.	Continue implementation and project management efforts to address the requirement for achieving LEED Gold and 35% improvement over ASHRAE for new projects using cost effective capital outlay strategies to achieve long-range operational benefits.
15% of existing buildings larger than 5,000 gross square feet (GSF) to be compliant with the five guiding principles of HPSB by FY 2015	A gap analysis was completed to identify systematic improvements necessary. A plan was developed to bring identified HPSBs into compliance. DOE's HPSB Assessment Tool will be used to meet the Guiding Principles.	Candidate HPSB buildings will be assessed for compliance with Executive Order 13423 Guiding Principles by December FY 2010.
16% water use reduction by FY 2015 from a FY 2007 baseline - 2% reduction each year based on the previous year, 26% by FY 2020	Water use has increased by approximately 10% since FY 2007.	Significant reductions will be realized upon successful expansion of the SERF that will enable LANL to exceed water goals before 2015. $1M has been requested for the SERF re-commissioning in Fy11. $15M for SERF expansion via Congressional Line Item Funding has been requested. LANL intends to meet the goal once SERF is on-line.
20% water consumption reduction of industrial, landscaping, and agricultural (ILA) water by FY 2020 from a FY 2010 baseline	LANL has determined that over 500K square feet of non-native grass can be removed to reduce non-potable water use.	A native landscaping plan will be developed and implementation of this plan will begin in FY 2011.
Summarize the site's GHG emissions profile and identify priority areas for reductions	Completed and incorporated in plan.	LANL will provide the emissions profile and a list of priority targets for reduction.
Local and regional planning to include regional transportation; energy planning; building policy; NEPA guidance; coordination on ecosystems	Regional transportation and energy planning activities are already in place.	LANL will continue to pursue and support the Smart Grid collaboration, PV on capped landfill, and the hydro-electric dam project.

Maintain cost effective waste prevention and recycling programs. Minimize generation of waste and pollutants through source reduction. Divert 50% of non-hazardous solid waste from disposal by the end of FY2015. Divert 50% of construction and demolition materials and debris from disposal by the end of FY2015. Increase diversion of compostable and organic material from waste streams. Reduce and minimize the quantity of toxic and hazardous chemicals and materials acquired, used, and disposed by FY2015. Comply with EPCRA reporting requirements	Mature P2 program in place to address most of these areas. EPCRA reports are completed annually as required by law	Develop a gap analysis to identify SSPP goals not currently addressed by the P2 program such as integrated pest and landscape management and GHG emitting chemicals.
Develop Sustainable Acquisition plan. Pursue opportunities with vendors and contractors to reduce GHG emissions. Acquire uncoated printing and writing paper containing at least 30% postconsumer fiber. Purchase products and ensure that 95% of new contract actions for products and services are energy efficient, water efficient, biobased-content, environmentally preferable, non-ozone depleting, recycled content, and non-toxic or less-toxic than alternatives.	Outreach to procurement representatives ongoing. Sustainable Acquisition requirements included in ESHQ plans for subcontractors. Sustainable Acquisition requirements included in Engineering Standards.	LANL will develop a Sustainable Acquisition plan to address SSPP goals.

1.4.4 Significant Project Design & Implementation Time

Projects	FY10	FY11	FY12	FY13	FY14	FY15	FY16+	Total Funding
HVAC Re-commissioning								$15 M
HPSB								$52 M
Smart Grid / Demand Management								$ 3.3 M
Footprint Reduction								$ 27.5 M
SERF expansion								$ 15 M
Steam Plant Replacement								$ 150 M
Auditing								$ 3.3 M
Building Scheduling								$ 4.3 M
ESPC I								$ 15 M
ESPC II								$ 20 M

Design Time
Implementation/Construction

1.4.5 Six Year Energy Plan Matrix

Initiative	Goal & Status	Attribute	FY '11	FY '12	FY '13	FY '14	FY '15	FY '16
Lighting and Water Audits Subcontracted lighting audits @ $.05/SF and in-house water audits done on existing overhead codes (no cost).	Quadrennial audit of 1/4 of covered buildings, 1.5m SF/year. Lighting audit goals exceeded for '09 & '10, water audits begun in '10 and 21% completed.	Cost	Ltg.-$70,000	Ltg.-$70,000	Ltg.-$35,000 (1)	Ltg.-$35,000 (1)	Ltg.-$35,000 (1)	Ltg.-$35,000 (1)
		Energy Saved	No energy saved directly, output from audits provides scope of work for scheduling and ESPCs for conservation measures.					
		Expense Saved	Same as above.					
		Goal Attainment	Lighting - 21% Water - 39%	Lighting -22% Water-39%	Lighting & Water - 25%	Lighting & Water - 25%	Lighting & Water - 25%	Lighting & Water - 25%
Extensive HVAC Audits and Re-Commissioning (RCx) Level III audit (performance modeling) at $0.75/SF and subcontracted re-commissioning at $0.50/SF.	Quadrennial audit and RCx of 1/4 of covered buildings, 1.5m SF/year. Audits performed in '09 & '10 included 26%; extensive re-commissioning program to start in '11. Buildings for '11 RCx (220,000 SF) are all setback candidates that will yield energy savings through the re-commissioning process at 75,000 BTU/SF-yr. and at a blended cost (gas and electric) of $10/million BTU.	Cost	HVAC Audit - $125,000 RCx - $110,000	Beginning in FY '12 as the second round of quadrennial HVAC audits and re-commissionings is needed; they will all be done using the more extensive method. HVAC auditing is anticipated to cost $1.1 million/yr. and RCx to cost $770,000/yr over this four year period.				
		Energy Saved		16,500 MMBTU	Although it is anticipated that these later efforts at auditing and re-commissioning will yield energy and cost savings, they cannot be predicted at this time and are omitted as a conservative assumption.			
		Expense Saved		$165,000	$165,000	$165,000	$165,000	$165,000
		Goal Attainment	RCx - 3.6%	Intensity - 0.8%	HVAC Audit & RCx - 25%	HVAC Audit & RCx - 25%	HVAC Audit & RCx - 25%	HVAC Audit & RCx - 25%
Fast-Track HVAC Audits and Re-Commissioning Check list audit and re-commissioning surveys performed by in-house system engineering and maintenance staff (no cost of existing T&E).	Quadrennial audit of 1/4 of covered buildings, 1.5m SF/year. This program will start in '11 as a means of addressing the gap in HVAC audit execution. Findings will be logged into ECM database but no credit is taken for energy savings.	Cost	Work is done in-house on existing overhead codes (no cost).					
		Energy Saved	Although energy savings are anticipated as a result of this initiative, no credit it taken.					
		Expense Saved	Based on the statement above, no credit it taken for dollar savings either.					
		Goal Attainment	HVAC - 13% RCx - 13%	HVAC - 60% RCx -60%				
Metering Installing electric, water, and natural gas meters.	To the maximum extent practicable: advanced metering for electricity (by October 2012), steam, and natural gas (by October 2016); standard meters for water	Cost	455,000	100,000	100,000	100,000	100,000	NA
		Energy Saved	Although energy savings are anticipated as a result of this initiative, no credit it taken.					
		Expense Saved	Based on the statement above, no credit it taken for dollar savings.					
		Goal Attainment	8 meters	10 meters for total of 100%	Gas - 7 meters	Gas - 7 meters	Gas - 6 meters	NA

Initiative	Goal & Status	Attribute	FY '11	FY '12	FY '13	FY '14	FY '15	FY '16
Setback Scheduling This initiative will use $100k in IS funding to implement setbacks and make other BAS repairs at those buildings that have been identified as eligible for setbacks and are not addressed in the extensive audit R-Cx initiative above.	The goal is institute setback as required in the management directive. Approximately 968,000 SF of buildings will be addressed in this initiative saving 75,000 BTU/SF-yr. at a blended cost (gas and electric) of $10/million BTU.	Cost	$250,000	The easily setback-scheduled buildings are complete at this point				
		Energy Saved		72,600 MMBTU				
		Expense Saved		$726,000	$726,000	$726,000	$726,000	$726,000
		Goal Attainment	Meets Management Setback Directive	Intensity - 3.7%				
HPSB The HPSB program will focus on two goals: bringing one or more buildings into compliance and disseminating the HPSB principles via the EMS EAPs.	The goal is to bring approximately 40 buildings into full compliance by 2015 however, funding has not been allocated only for FY '11. It is anticipated that approximately 300,000 SF of buildings will be brought into full compliance and that these will be placed on night setback yielding the energy savings shown for FY '12.	Cost	$500,000	A commitment has not yet been made for funding of the HPSB program in FY '12 and later.				
		Energy Saved		22,500 MMBTU				
		Expense Saved		$225,000	$225,000	$225,000	$225,000	$225,000
		Goal Attainment	All 3 Types of Audits & RCx - 5% Meets Management Setback Directive	Intensity - 1.1%				
ESPC-1 This is the current NORESCO project involving lighting and HVAC upgrades.	Addresses goals for lighting and HVAC audits (FY '09) and re-commissioning FY '11.	Cost	$1.2 million	$0.2 million				
		Energy Saved	65,500 MMBTU					
		Expense Saved	$0	$83,000 (2)	$83,000 (2)	$83,000 (2)	$83,000 (2)	$83,000 (2)
		Goal Attainment	Intensity - 3.3% RCx - 21%					
Second ESPC A second ESPC projects is presented and it is assumed to be identical to ESPC-1 -- lighting and pneumatic controls replacement. It will begin when funds become available, in second half of FY'12. The scope will be taken from the audits performed in the initiatives above.		Cost			$0.8 million	$1.0 million	$1.0 million	
		Energy Saved				65,500 MMBTU		
		Expense Saved			$83,000 (2)	$83,000 (2)	$83,000 (2)	$83,000 (2)
		Goal Attainment				Intensity - 3.3%		
Footprint Reduction This is a long-standing LANL project in which new buildings are swapped for old with the net footprint of the Lab reduced. New building energy consumption is estimated at 175,000 BTU/SF. Demolished old buildings are estimated at 255,000 BTU/SF. Contributes to energy intensity goal.		Cost	$3 million	$8.6 million	$1.5 million	$3.8 million	$4.7 million	$5.4 million
		Energy Saved	22,500 MMBTU	34,800 MMBTU	40,900 MMBTU	25,400 MMBTU	16,400 MMBTU	15,300 MMBTU
		Expense Saved (3)	$225,000	$348,000 ($573,000)	$409,000 ($982,000)	254000 ($1.2 million)	$164,000 ($1.4 million)	$153,000 ($1.5 million)
		Goal Attainment	Intensity - 1.1%	Intensity - 1.8%	Intensity - 2.1%	Intensity - 1.3%	Intensity - 0.8%	Intensity - 0.8%

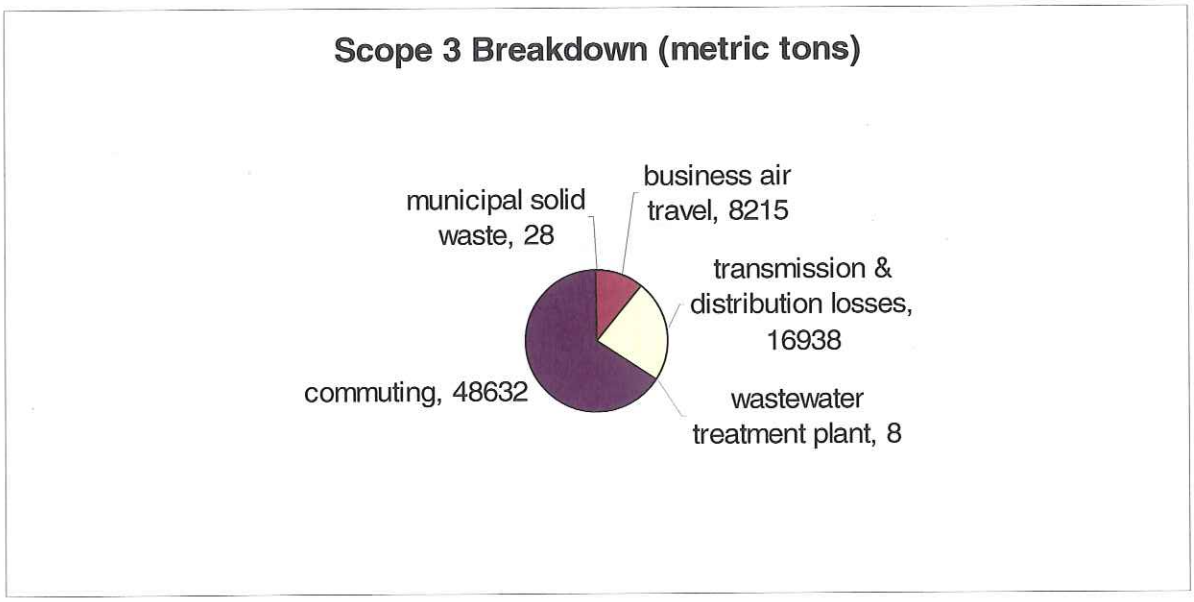
Initiative	Goal & Status	Attribute	FY'11	FY '12	FY '13	FY '14	FY '15	FY '16
Cost of Energy Conservation Initiatives (4)			$2.71 million	$2.14 million	$2.8 million	$3 million	$3 million	$1.9 million
Annual Savings Due to Energy Conservation Initiatives			$0.2 million	$1.8 million	$2.3 million	$2.5 million	$2.7 million	$2.8 million
Energy Saved by New Initiatives This Year (MMBTU)			88,000	146,400	40,900	90,900	16,400	15,300
Yearly Intensity Goal Total (Cumulative Total) starting with current reduction from '03 to '10 total of 13.2% (5)			4.5% (17.7%)	7.4% (24.8%)	2.0% (27.1%)	4.4% (31.5%)	0.8% (32.3%)	0.7% (33.0%)

Notes
(1) The cost of auditing is assumed to decrease by half after the initial audit.
(2) The dollar amount saved is only 8% of the value of the total energy saved, the portion not paid to NORESCO. The O&M savings benefit the individual FODs, not Utilities Division.
(3) In the case of footprint reduction a running total is shown in parenthesis including prior year savings.
(4) This cost does not include footprint reduction cost.
(5) Corrected for annual reduction in total laboratory square footage.
General Note: Inflation of expense and escalation of utility unit prices are not accounted for in the calculations above.

1.4.6 LANL Energy Reduction due to Footprint Elimination

Disposition Fiscal Year	Shutdown or Planned Shutdown Status (gsf)	Footprint Eliminated (1) (gsf)	New Construction Footprint Added (1) (gsf)	Energy Reduction Safe Shutdown and Elimination of Footprint (2) (MMBTUs)*	Energy Increase New Construction (3) (MMBTUs)*	Net Energy Reduction/yr (MMBTUs)*	Accumulated Energy Reduction (MMBTUs)*
FY 2011	(152,162)	(582,440)	281,500	(71,826)	49,263	(22,564)	(22,564)
FY 2012	(164,892)	(97,727)	12,700	(36,965)	2,223	(34,743)	(57,306)
FY 2013	(216,259)	(61,687)	14,300	(43,387)	2,503	(40,885)	(98,191)
FY 2014	(82,486)	(158,206)	8,000	(26,867)	1,400	(25,467)	(123,658)
FY 2015	(70,985)	(47,843)	-	(16,356)	-	(16,356)	(140,014)
FY 2016	(83,920)	(40,380)	16,000	(18,097)	2,800	(15,297)	(155,311)
TOTAL FY11-FY15	**(770,704)**	**(988,283)**	**332,500**	**(213,498)**	**58,188**	**(155,311)**	
(1) Gross Square Feet (gsf) consistent with the Facility Information Management System and the Ten Year Site Plan							
(2) Energy reduction is 70% reduction when shutdown and 30% reduction when eliminated/demolished							
(3) LANL energy usage for new construction is based on 175,000 BTUs/gsf/yr							

1.4.7 Scope 3 GHG Emissions at LANL in FY2008



1.4.8 GHG Inventory at LANL for FY2008

Emissions Scope	Category	Metric tons CO2 equivalent
Scope 1	Fugitive Gases	18,167
	Refrigerants	614
	Asphalt Plant	147
	Boilers	28,917
	Permitted Generators	47
	Power Plant	27,153
	Combustion Turbine	949
	Standby Generators	218
	Fleet Vehicles	6091
	Other Onsite Vehicles	1799
Scope 1 Total		84,102
Scope 2	Purchased electricity	244,574
	Purchased renewable electricity	8362
Scope 2 Total		252,936
Scope 1&2 Total		337,038
Scope 3	Transmission & Distribution Losses	16,938
	Employee Commuting	50,933
	Business Air Travel	6768
	Municipal Solid Waste	0
	Wastewater Treatment	21
	Business Ground Travel	259
Scope 3 Total		74,919
Scope 1,2,&3 Total		411,957

2 Goal Performance Review and Plans

2.1 Scope 1& 2 Greenhouse Gas Reduction

2.1.1 Energy Intensity Goal Status

The purpose of this goal is to reduce energy intensity by no less than 30 percent by FY 2015, relative to FY 2003 (DOE Order 403.2B, 1.b (1) and Attachment 1, 5.a). Between FY 2003 and FY 2010, LANL reduced its cumulative energy intensity by 15 percent.

LANL estimates a three percent savings from the 2003 baseline resulting from energy conservation projects and outreach. Refer to the attached CEDR for reduction values and associated projects.

2.1.1.1 Performance Status

The Associate Directorate for Nuclear and High Hazard Operations issued an institutional procedure requiring that facilities with Building Automation Systems (BAS) use the night setback feature to reduce energy consumption. The Utilities and Infrastructure (UI) energy management team reviewed the buildings to ensure compliance with the procedure.

An ESPC Detailed Energy Survey (DES) phase of the project was brought to a close and the DES report was accepted by DOE. DOE issued the delivery order to NORESCO and Los Alamos National Security, LLC (LANS) concurred by means of a tri-party agreement. NORESCO signed an agreement with a

prime subcontractor, B&D Electric of Albuquerque, NM, to provide the rest of the design effort and all construction work. By the end of FY 2010, the final design work should be 25 percent complete. This ESPC DO will require an initial investment of $12.9 million by NORESCO and promises an estimated $1.2M in annual savings over a 20-year period.

To achieve the goals of avoiding growth and reducing the facility footprint, LANL removed approximately 667 k gsf of facilities between FY 2003 and FY 2009. Multiple drivers motivate the need for footprint reduction including internal LANL goals and Federal mandates. FY 2010 accomplishments include the D&D of the old LASO building, D&D of over 30,000 gsf of trailers and transportable buildings and D&D at TAs-18, 21, and 54. Based on the energy usage in the 2003 baseline of 255,388 BTU/gsf/yr for LANL, estimated accumulated energy intensity reduction resulting only from safe shutdown and elimination of footprint will be 123,658 MMBTUs by 2014. Consolidating functions within a smaller LANL footprint comprised of new facilities and enduring existing facilities will ultimately allow for the removal of obsolete inefficient structures. Energy reduction goals cannot be met without the net benefits of footprint reduction.

As part of the Laboratory's energy awareness and outreach goals, the Energy Management Council co-hosted an Energy Town Hall event. The third annual event was open to the public. LANL's Environmental Stewardship Group (ENV-ES) promotes and recognizes individuals and teams that work to conserve energy, water, and fuel. Over the past five years, LANL has received more National Nuclear Security Administration (NNSA) awards than any other site in the DOE complex. This year, LANL won three NNSA Best-in-Class awards and five national NNSA Environmental Stewardship awards, including one for Fleet Management.

The Energy Management Council promotes and informs employees about energy and fuel conservation opportunities. The annual EMS Action Plan process integrates the goals of the Site Sustainability Plan into each Directorate's Action Plan. Teams, groups, and directorates also contribute to awareness and outreach goals. An analysis by UI and Energy and Infrastructure Analysis (D-4) of Laboratory energy flows, costs and rate alternatives was completed in order to identify energy efficiency rate options and support internal reviews prior to rate implementation.

2.1.1.2 Planned Actions

Table 1.4.5 represents LANL's five year energy project schedule, which is contingent on funding, to achieve the 30 percent energy intensity reduction and water reduction goals, but more importantly, the table attempts to accurately capture the funding required and will serve as the basis for out year budget requests.

Reconfiguration of the central heat and power plant at TA-3 and revitalization of the distribution system could provide a significant proportion of the energy savings for LANL. Much of the steam plant and the piping system is more than 50 years old and is not energy efficient. Replacement of the TA-3 Co-generation (COGEN) plant is still a viable and critical project.

UI will further develop the BAS night setback program by establishing a Measurement and Verification program, Operations and Maintenance Criteria for office temperature standards. In addition, LANL will invest $250,000 in FY 2011 to enable night setbacks within facilities with a BAS.

A program to ensure a funding stream for energy and water efficiency improvements and the installation of on-site renewable energy projects will be developed. This program will apply at least 50 percent of the previous year's expected savings into the following year's energy and natural resources program to ensure the funding stream.

The NORESCO project plan details the design work to be completed and the construction work to be nearly complete within FY 2011; the target for completion of construction is December 2011. Lessons learned from ESPC I will facilitate planning an FY 2011 ESPC DO#2 with a similar scope which is planned to begin development in FY12. Completed projects for 2010-2011 ESPC DO #1 are expected to reduce the energy intensity in Goal-Target facilities by about 65,000 MMBTU per year.

About 332,500 gsf of new construction of facilities is planned between the beginning of FY 2011 and FY2016. An estimated 255,388BTUs/gsf/yr is used in Table 1.4.6 to calculate the *net* energy reduction by FY 2015 resulting from the elimination of excess facilities and construction of new ones. From FY 2011 to FY 2016, the *net* reduction in gsf is planned to be about 1.0M gsf and the *net* energy reduction will be about 155,311 MMBTUs (Table 1.4.6).

New facilities will be built in accordance with new federal and state guidelines to be more energy efficient than the buildings they replace. One of the larger facilities included in new construction is the CMR Replacement-Radiological Laboratory Utility Office Building (RLUOB), scheduled for beneficial occupancy in FY 2011. This facility is in the process of achieving Leadership in Energy & Environmental Design (LEED) certification. RLUOB won a 2010 EStar award. (Refer to CEDR, Tab 7, New Building Construction)

As funding projections are adjusted annually as part of the budget process, the Infrastructure Planning (IP) Division modifies its site-wide disposition plan to align with program expectations for disposition. The disposition plan includes funding source, planned excess year, estimated disposition year, amount of gsf, and related costs. Annual disposition plans are aligned with this Site Sustainability Plan, the metering plan, and the TYSP, which includes new construction or lease plans.

Integration of the Facility Disposition Plan with the Site Sustainability Plan goals will help assure that investments are not made for metering or for energy reduction projects in facilities that are planned for disposition. In addition, plans to meet the FY 2015 energy intensity goals must factor in the effect of the reduction of the total Laboratory footprint and projected energy reduction associated with facilities planned for disposition.

Increasing awareness to the Laboratory community on energy efficiency and sustainability is a critical component of the Sustainability Program. The Laboratory will use the EMS to establish, track, and review progress toward meeting procurement goals in the Business Services EMS Action Plan. Employee incentive programs are important and will be used to reward individual performance for reducing GHG emissions.

Milestone	Deliverable	Due Date
Make meters count – develop and implement a program to inform and educate facility personnel and tenants on energy usage.	Program details – example of FOD quarterly report	March 2011
Invest funding for implementing night setbacks at facilities with BASs	Verification of night setback points	August 2011
Completed FY 2011 facilities of the quadrennial energy audit plan (per EISA 2007).	List of ECMs	August 2011
Increase desktop transformation (virtual desktops) and cloud computing.	Status report with total number of virtualized desktops and status report on cloud computing	August 2011

2.1.2 Increase Departmental Renewable Energy Consumption

LANL plans to maximize installation of on-site renewable energy projects at sites to acquire at least 7.5 percent of each site's total (buildings and metered process) annual electricity consumption from on-site renewable sources (DOE Order 430.2B, 4.c. (2) and Attachment 1, 6.b, 2005 Energy Policy Act (EPACT), Section 203 and EO 13423, Section 2 (b)) or continue to purchase Renewable Energy Credits (RECs).

2.1.2.1 Performance Status

LANL purchased 31,950 MWhr RECs in FY 2010, which comprise 7.5 percent of the total electrical energy use. LANL continued working with DOE/NNSA and LAC and modified the Electric Coordination Agreement to pursue Photovoltaic (PV) generation options.

2.1.2.2 Planned Actions

LANL will continue to pursue on-site renewable energy projects to fulfill the renewable energy requirements. The Los Alamos County (LAC) is constructing a 3MW low flow hydro-turbine on the US Army Corp of Engineer's Abiquiu Dam. LANL will use 80 percent of the power and LAC will use approximately 20 percent. Tentatively, this project should be completed in May 2011. In addition, LANL continue planning and implementation of the 2 MW of PV on the closed DOE/County landfill with an on-site battery to help with renewable energy integration into the grid and peak shaving. Abiquiu will produce approximately 7,000 MWh per year, and the PV will produce approximately 2,200 MWh per year, and that is 18,400 MWh with double credit for on-site production. The Laboratory used approximately 421,000 MWh in FY 2010, and the estimated percentage for on-site renewable energy is 4.4% once Abiquiu and the PV is operational.

LANL will support NNSA to renegotiate the LAC ECA to support third party development of long-term renewable energy on-site generation to sustain secure and reliable generation sources for the Laboratory and support NNSA's negotiations with LAC to extend the ECA.

2.1.3 Reduce Departmental Fleet Petroleum Use by 2 Percent Annual and Increase Alternative Fuel by 10 Percent Annually over the Previous Year

LANL plans to reduce petroleum consumption in the LANL Fleet by increasing the use of AFVs to meet the goals of EPAct 2005, EO 13423 Section 2(g) and DOE Order 430.2B. Annual awareness campaigns regarding fuel conservation occur during April's Earth Week, are communicated on the Laboratory's website, and are included in the FY 2011 EMS Institutional Goals.

2.1.3.1 Performance Status

LANL implemented new procedures, which required Division Leaders or their designees to review and authorize fleet vehicle replacements. These designees determine if a replacement is required to meet a programmatic need or if a vehicle could be downsized. As of October 2010, the Laboratory operated with 1,548 vehicles, which is below the approved DOE/NNSA approved fleet cap of 1,571 vehicles. Currently, ~18 percent of LANL's fleet gets 21 MPG or better.

LANL began testing the cost and efficiency of E-85 in flex-fuel vehicles using eighty SOC vehicles. LANL subcontracted a local pueblo to provide bulk E-85 fuel and procured a mobile fuel tanker to transport the fuel. LANL's E-85 consumption in 2010 was 24,318 gallons. This represents four percent of the total gasoline usage on site. E-85 is comprised of 15 percent petroleum hydrocarbon and 85 percent ethyl alcohol, and with the substitution of the four percent, we achieve a 3.4 percent petroleum hydrocarbon reduction. The test population provides data related to operating and fuel costs and

maintenance requirements. LANL will use these data to determine the practicality of using E-85 in additional vehicles.

LANL's Fleet Team assessed local vendor rates for comparable services. They posted the rates on LANL's internal website for vehicle operators to reference when scheduling vehicle service. The Fleet Team developed a standard preventative maintenance checklist, which stipulates the minimum level of vehicle service that each vendor must provide and attest to by their signature. As always, employees are encouraged to use public transit whenever possible for on/off-site transportation and to pool government vehicles for the most fuel efficient fleet.

2.1.3.2 Planned Actions

The Fleet Team will continue to research and test alternative fuel vehicles (AFVs) including Plug-in Hybrids and electric cars. LANL currently has nine Hybrid vehicles and as part of the FY 2010 replacement cycle ordered an additional 28 Hybrid vehicles. The team will continue collecting data on E-85 and Hybrid vehicles and work with management to continue downsizing and right sizing the Laboratory's fleet. In addition, LANL will continue to support initiatives related to the development of alternative fuel infrastructure in Los Alamos County by initiating a Request for Proposal for a local alternative fuel vendor.

The Fleet Team will work to meet fleet and fuel use goals as outlined in DOE Order 430.2B and EO 13423 by developing an effective customer awareness campaign and pursuing employee efficiency strategies to reduce energy use such as low-rolling resistance tires and synthetic oil to extend replacement frequency. In addition, the team will evaluate all of the equipment and fleet to establish any "green" alternatives and ascertain whether the equipment/fleet uses diesel, and if so, what type of biodiesel is possible.

Milestone	Deliverable	Due Date
Create "Green the Fleet" matrix for determining where LANL can increase environmentally preferable types of equipment or vehicles	Matrix	June 2011
Develop and issue RFP for alternative fuel vendor	RFP issue date	August 2011

2.1.4 Metering

LANL plans to install, to the maximum extent practicable, metering devices to measure potable water, electricity, steam, and natural gas (DOE Order 430.2B, 4.c. (4) Performance Status and Attachment 1, 6.d.).

2.1.4.1 Performance Status

LANL has installed electric meters in 103 buildings out of 122 meters necessary to meet the EPAct 2005 requirement for metering. All electricity distributed throughout LANL is measured by 125 meters at the 13.2 kilovolt level in the distribution switchgears. Individual building meters are being installed as funding allows. LANL has 40 water meters that are currently read and usage is reported. These meters monitor water used by large facility cooling towers and 8 satellite steam plants, individual building water meters will be installed per guidance of 430.2B. Natural Gas coming into LANL is metered at two main stations, Tech Meters 1 and 4. There are 17 other gas meters/consumers that are read and usage reported.

Of these 17, 9 gas meters are interchange points between LANL and Los Alamos County. Steam is metered as it leaves the TA-3 Co-Generation Plant. Currently, LANL is not metering steam at the building level. The Laboratory is planning to refurbish the current steam distribution system and this project will include new steam meters, and therefore steam metering will not occur until this project is finalized.

2.1.4.2 Planned Actions

During FY2011 UI will continue with electric meter installations per the FY2011 Metering Plan. Advanced meters listed within the Metering Plan will be connected for remote communications through the LANL intranet where feasible. Additional work is planned for the installation of a device that will take natural gas and water meter outputs and communicate the data remotely to the current metering server for continuous monitoring and data collection. In FY2011 one natural gas and one water meter are slated for this remote connection. If successful, future connections will be made at locations with water and or gas meters which will aid in meeting the goals set forth in DOE's Strategic Sustainability Performance Plan. In order to meet the 430.2B goals for natural gas and water metering, UI will bring in 4 water meters and 12 natural gas meters. By 2016 LANL will have a total of 44 water meters, 27 smart and 17 standard, and 31 natural gas meters, 14 smart and 17 standard. Once all of the locations necessary to meet the 430.2B are metered, UI will work connect any smart meters to be remotely read/monitored and will begin replacing standard meters with smart where practicable.

The Laboratory is planning to manage, report, and share energy usage information across the site. Engineering Standards for Natural Gas and Water will be updated to include the requirement for a meter on gas and water. The update will specify meter types and require a communications path for said meter back to the metering server for continuous monitoring and data acquisition.

UI is working with the Decision Applications Group (D-4) to develop a database that will collect metering data from various sources and create consumption reports for Facility Operations Directors, facility coordinators, and tenants. Within the next 12-18 months, this database will be used to analyze and trend energy consumption on a facility basis to improve tenant and building management awareness and conservation efforts. Usage information will be communicated to the FODs and programmatic tenants to improve awareness to reduce energy consumption through a quarterly report as well as available through the UI webpage. In addition, LANL will complete installation of all advanced electric meters.

Milestone	Deliverable	Due Date
Restore water meter remote reading capability to FY 2005 working status.	Remote meter applications	January 2010
Publish Metering Plan to address steam and gas metering as appropriate (attached to final SSP).	Metering Plan	December 2010 (or 45 days after DOE metering guidance is published)
Complete meter installations per FY 2011 Metering Plan.	List of installed meters	August 2011

2.1.5 Cool Roofs

DOE's Roof Asset Management Program (RAMP) manages roofing assets across the DOE Complex. The RAMP is a subset of the Facilities and Infrastructure Recapitalization Program (FIRP).

2.1.5.1 Performance Status

FIRP's mission is to restore, rebuild, and revitalize the physical infrastructure of the nuclear weapons complex, primarily by reducing deferred maintenance. RAMP was established as a subset of FIRP to provide focus on the National Enterprise roofing assets, which comprised a large segment of the deferred maintenance with a greater impact to facility readiness.

Under this RAMP CMR Re-Roofing Project (Project), the following actions are occurring in Wings 1, 2, 4, 5, 9, and other smaller connecting roof sections of the CMR: 1) Complete tear-off of existing roofing system (approximately 135,000 sq. ft.), which includes original roofing system with an overlay. 2) Install a new Atactic Polypropylene Modified Bituminous roofing system, insulation, and flashing. Meet all Green Roof requirements.

LANL under the RAMP program has been installing cool roofs for the last 3 years. Most current projects are CMR (145,000 sf), 55-0114 (8,000 sf), 03-0132 (11,000 sf), and 03-0039 (155,000 sf) in FY 2009.

2.1.5.2 Planned Actions

LANL RAMP will continue to install cool roofs for the duration of RAMP (ends in 2013).

2.1.6 Training

LANL will ensure that individual employees including contractors are sufficiently trained in energy management and third-party financing options or that such training will be obtained as well as refresher training (DOE Order 430.2B, 4.h. (1) and Attachment 1, 1.c).

2.1.6.1 Performance Status

LANL has provided training funds for at least one individual to become certified energy managers (CEM) to effectively implement energy and water management programs. LANL CEMs work with facility management to achieve energy and water reduction goals. These individuals provide oversight for energy audits, advise building operators about conservation measures, and coordinate energy conservation programs and projects. LANL sponsored a FEMP-provided energy audit training for facility engineers and managers. In addition, LANL staff attended an HPSB Guiding Principles training, the GovEnergy workshop, and the GreenGov Symposium.

2.1.6.2 Planned Actions

Improve employee awareness of energy management goals and expectations and ensure the availability of staff resources (funding and personnel) that will be needed to achieve the goals (in addition to the ESPC) the site will allocate towards each of the goals. Communication efforts will focus on energy objectives and targets within the Environmental Management System process. The successful implementation of this order is within the performance evaluation of UI Energy Management staff. In addition, by September of FY 2011, at least one additional employee will complete the CEM certification.

Milestone	Deliverable	Due Date
CEM designation for one employee.	Completed training certificate	July 2011

2.1.7 SF6 Reduction

LANL is committed to reducing fugitive gas emissions, particularly from SF6, which is the largest component, where feasible.

2.1.7.1 Performance Status

Sulfur hexafluoride makes up the vast majority of fugitive gas emissions at LANL. According to LANL's GHG 2008 emissions inventory, SF6 accounts for approximately 5% of total Scope 1 and Scope 2 emissions when measured using metric tons of CO2 equivalent. SF6 purchases, disposal, and inventory are tracked with a computer program called ChemLog. Currently, LANL has two employees that participate in the DOE Fugitive Emissions working group.

2.1.7.2 Planned Actions

A Pollution Prevention Opportunity Assessment (PPOA) will be conducted in FY 2011 to determine how best to reduce SF6 emissions on site. LANL will continue to participate in the DOE Fugitive Emissions working group.

Milestone	Deliverable	Due Date
PPOA to determine the best pathway to reduce SF6 emissions.	PPOA	August 2011

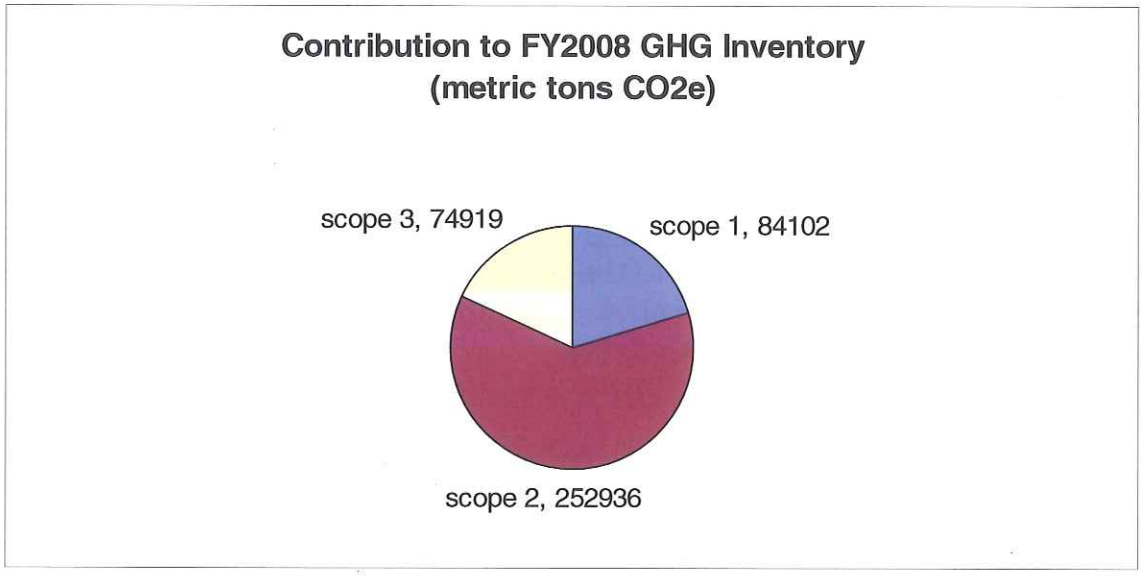
2.1.8 Overall Reduction of Scope 1 & 2 GHG Emissions

LANL intends to comply with Environmental Protection Agency (EPA), New Mexico Environment Department (NMED), and DOE standards to achieve required GHG reduction and reporting objectives. A study was commissioned to evaluate the replacement of the TA 3 Co-generation (COGEN) plant and/or reconfiguration of the TA-3 steam distribution system. Much of the steam plant and the piping system is more than 50 years old and is not energy efficient. When it occurs, replacement of the COGEN and steam plant could reduce GHG emissions. The amount of the GHG emissions reduction will depend on the specifications of the new equipment. Reconfiguration of this system could provide a significant proportion of the energy savings for LANL. A proposal scope for replacement of the TA-3 steam plant is under development.

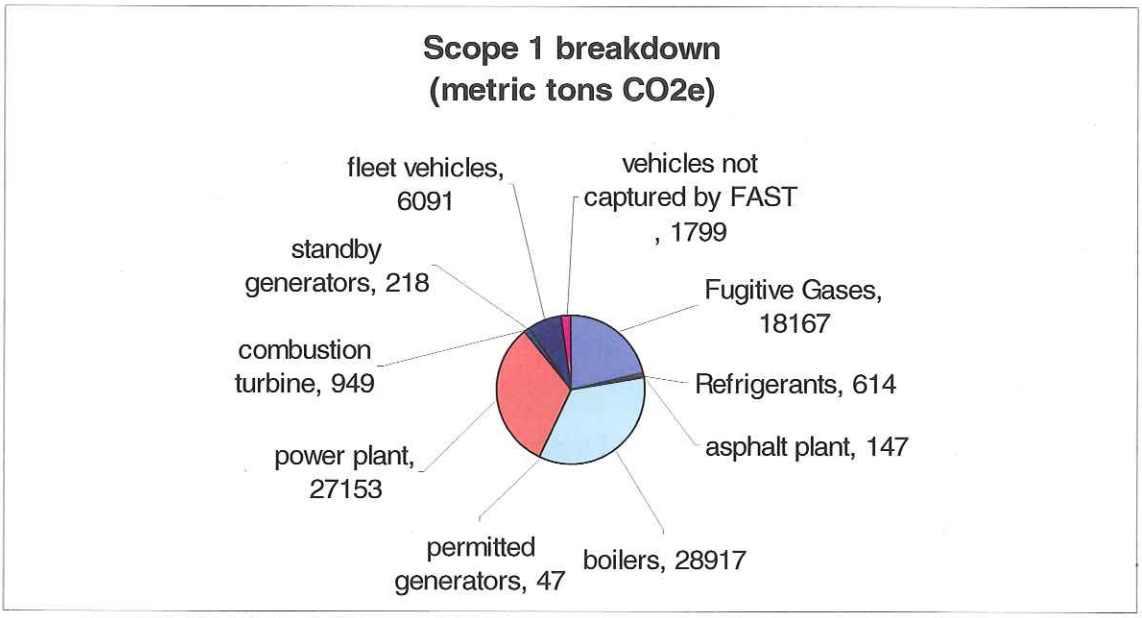
2.1.8.1 Performance Status

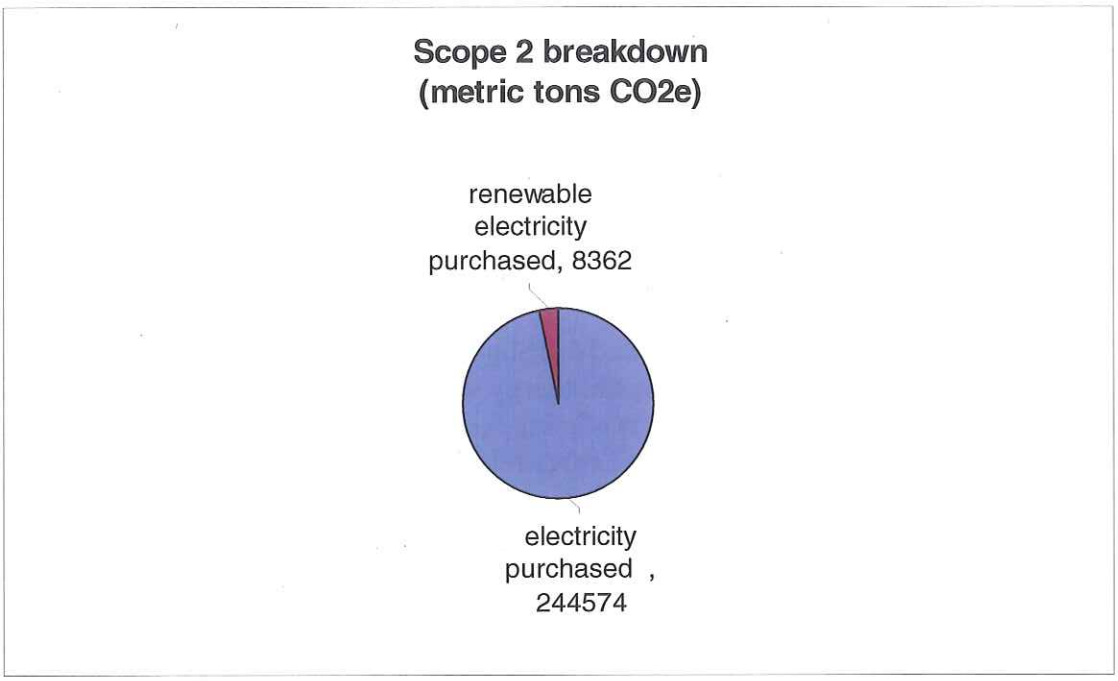
LANL reported direct and indirect carbon dioxide and methane emissions for CY 2009. LANL also reported its sulfur dioxide inventory and refrigerant emissions along with electricity use. Metric tons of carbon dioxide equivalent for fugitive gases and refrigerants are shown in section 1.4.8.

The pie chart below shows the relative contributions of scope 1, 2, and 3 categories to LANL's overall GHG emissions.



The pie charts below show a breakdown of the scope 1 and 2 GHG emission categories for LANL's FY08 baseline.





2.1.8.2 Planned Actions

LANL plans to focus its efforts on decreasing energy consumption by implementing projects, which are detailed in the attached CEDR. Mission growth and energy usage related to additional computing will increase. LANL is strategically planning to invest in renewable energy to decrease GHGs and reduce overall energy consumption to allow for mission growth. LANL will develop an integrated, resource loaded plan that will address energy, water conservation, and GHG goals. This plan will highlight the resources and technology required to meet the GHG reduction goals.

Milestone	Deliverable	Due Date
An integrated, resource loaded multi-year plan addressing site "Energy, water conservation, and GHG goals" – Draft to be developed and given to LASO in May.	Plan	August 2011

2.2 Scope 3 Greenhouse Gas Emissions Reductions

DOE has a goal to reduce its scope 3 GHG emissions by 13 percent by FY2020 over the baseline established for FY2008. LANL will strive to reduce GHG emissions in scope 3 categories to help DOE attain its goal. Figure 1.4.7 shows the sources that contributed to scope 3 GHG emissions at LANL in FY2008.

2.2.1 Performance Status

As shown in Figure 1.4.7 employee commuting contributes the most to scope 3 GHG emissions at LANL. Several years ago, LANL implemented the 9/80 schedule, which gave employees the option to work 80 hours during nine days in a two-week period. This schedule option allowed employees to cut their commute distance and time by 10 percent. More recently, mass transit to LANL via bus has been expanded from the surrounding communities of Santa Fe and Espanola and also within Los Alamos and White Rock. In addition, the Rail Runner train became operational, so employees from the Albuquerque area have this option to connect with buses from Santa Fe to Los Alamos instead of driving personal

vehicles. LANL provides taxi service for employees to travel between sites during the day so that fewer people require their personal vehicles. For many years, LANL has organized and continues a special section on its internal website to connect potential carpoolers with each other.

LANL is actively increasing the use of virtual meetings to decrease the amount of business travel, including air flights and rental cars. The use of webinars has become much more common, which decreases the necessity to travel for training. Virtual meeting rooms exist where videoconferencing with multiple sites can be arranged. Sharing rental cars when possible is always encouraged.

GHG emissions related to electricity transmission and distribution losses are directly related to the amount of electricity purchased and the distance to the energy source. Los Alamos County is planning a solar energy installation in the future. When the installation is complete, LANL may be able to get some of its energy from this renewable and local source. Losses related to transmission and distribution of this solar power would be very low.

LANL operates a centralized wastewater treatment plant with aerobic and denitrification treatment. The GHG emissions from this plant are related to the number of employees working at LANL. This centralized treatment plant connected all areas at LANL in 1992 and consolidated three treatment systems into one. Approximately 200 employees currently reside in buildings that are served by septic tanks, and these septic tanks contributed the majority of the GHG emissions in this category.

LANL has actively participated in pollution prevention for well over a decade, and one of the targets has always been to reduce the volume of municipal solid waste generated at LANL. All municipal solid waste from LANL is disposed of offsite, so the resulting GHG emissions are considered to be zero based on the DOE calculation guidance. Many kinds of unwanted materials can be recycled at LANL, including toner cartridges, aluminum cans, plastic bottles, paper, and cardboard.

2.2.2 Planned Actions

In the future, LANL expects to participate in a program that allows employees who commute via bus or train to purchase their tickets with money that they set aside in a special tax-free account to save them money. Incentives for employees who bike or walk to work will also be developed and implemented.

LANL will continue to encourage the use of webinars and virtual meetings to reduce the need for business air and ground travel. When more than one employee travels to the same off-site meeting, LANL will encourage the sharing of rental cars. In addition to reducing GHG emissions, reduced air travel and use of rental cars allows more money to be spent on program work.

GHG emissions from municipal solid waste and wastewater treatment make up a very small fraction of LANL's scope 3 emissions. The emissions calculated from wastewater treatment depend on the number of employees working at LANL, and no actions are planned to reduce the number of employees to reduce GHG emissions. Future footprint reductions may move employees into buildings without septic tanks, and GHG emissions in the wastewater category would decrease. LANL's recycling programs are ongoing, and the Pollution Prevention team at LANL is always looking for new ways to minimize the amount of municipal solid waste that is generated onsite. No municipal solid waste is disposed of on LANL property, so GHG emissions from municipal solid waste are expected to remain zero.

Milestone	Deliverable	Due Date
Encourage use of webinars and virtual meetings through use of articles or other communication avenues.	An article will be submitted for inclusion on an Environment, Safety, and Health poster.	July 2011

2.3 Comprehensive Greenhouse Gas Inventory

DOE is committed to reductions in GHG emissions as required by Executive Order 13514. The reductions in emissions are expected to occur at least by FY2020 based on emissions estimated for FY2008. DOE has a goal to reduce scope 1 and scope 2 GHG emissions by a combined 28 percent and scope 3 GHG emissions by 13 percent during the next ten years. LANL estimated its GHG emissions for FY 2008 and compiled data shown in Table 1.4.8. LANL will comply with Environmental Protection Agency (EPA), New Mexico Environment Department (NMED), and DOE requirements to track and report GHG emissions.

2.3.1 Performance Status

LANL estimated its baseline GHG emissions for FY 2008 and compiled a table as shown in Table 1.4.8. LANL also submitted its CY 2009 annual GHG emission report to NMED in June 2010. LANL submitted its FY10 scope 3 emissions to the Pollution Prevention Tracking and Reporting System in December 2010. Complete FY 2010 data is not yet available, but in future years, LANL will present comparisons with the FY08 baseline in this report.

2.3.2 Planned Actions

LANL will complete its GHG emissions inventories for DOE, EPA, and NMED.

Milestone	Deliverable	Due Date
Complete 2010 GHG emissions inventories for DOE, EPA, and NMED.	Annual emissions inventory report submitted.	January/March/ April 2011

2.4 High-Performance Sustainable Design

The Laboratory is working to attain LEED Gold certification for all new construction and major building renovations of more than $5 million; and attain greater than 35% improvement in energy performance, over ASHRAE standards. Meet the requirement for 15 percent of LANL buildings to meet standards for HPSBs by FY 2015.

2.4.1 HPSB / New Construction – LEED Gold

LANL has written requirements within internal engineering standards to incorporate sustainable design including the LEED Gold standard into the building design process. The Laboratory ensures that 430.2.B requirements for LEED Gold and energy performance are incorporated into applicable projects entering the conceptual design phase and that preliminary project estimates conducted include provisions for LEED Gold and energy compliance. LEED awareness training has been conducted and will continue with LANL Project Managers and estimators.

HPSB New Construction Summary (ref. CEDR worksheet 7. New Building Construction)						
Fiscal Year	LEED Gold (or higher)		LEED Silver (or lower)		Guiding Principles (NC < or = $5M)	
	Number	GSF	Number	GSF	Number	GSF
Prior FYs						
FY08						
FY09						
FY10						
FY11			3	249000	1	3000
FY12			1	22000	1	3700
FY13						
FY14	2	58000				
FY15	1	80000				
Totals	3	138000	4	271000	2	6700

2.4.1.1 Performance Status

Currently, LANL does not have any LEED Gold buildings on site. However, LANL has developed experience with LEED on 4 major buildings (NSSB, SCC, NISC and CINT) which followed a LEED format during the design process, without formal registration with the USGBC.

2.4.1.2 Planned Actions

LEED Gold and energy performance as standard design/construction requirements are being incorporated into early project design. LEED training has been generated for LANL Project Managers to increase awareness and knowledge in requirements as well as process. Close to 1 million square feet of major new projects, currently in the planning stages are being formulated to be certified as LEED Gold projects. These facilities include: CMRR Nuclear Facility (400,000 sq.ft.), MaRIE M4 Laboratory/Office building (300,000 sq.ft.), Global Security Laboratory/Training/Office building (170,000 sq.ft.), CERDA Energetic Materials Laboratory/Office (70,000 sq.ft.) TA-03 Fire Station (30,000 sq.ft.), TRU-Waste Office (30,000 sq.ft.) and the Wellness Center Replacement (20,000 sq.ft.). Upcoming or current construction projects identified for LEED certification include: Tactical Training Facility, Indoor Shooting Range and the TA-48 Mass Spectrometer building. LANL continues to develop and implement innovative approaches to address the requirements for achieving LEED Gold and meeting energy performance mandates for new projects that could also be used across the complex. Refer to the attached CEDR, Tab 7 New Building Construction.

Milestone	Deliverable	Due Date
Research and implement where practicable, innovative approaches to address the requirement for achieving LEED Gold and energy performance for new projects that could also be used across the complex.	Status report on new construction and LEED applicability	May 2011

2.4.2 HPSB Existing Buildings

Nineteen LANL buildings were selected for HPSB certification and are designated within the FIMS database. The sum of the areas of these buildings is intended to meet the requirement that at least 15 percent of the expected 2015 enduring footprint will meet standards for HPSB guidelines by FY 2015. Thirty-nine buildings were selected for HPSB based on the new guidance to select 15 percent of the existing facilities and building leases above 5,000 square feet.

HPSB Summary Progress and Projections Toward 15% Target				
	Buildings		GSF	
	Number	Percent	Number	Percent
Site 15% Target	39	15	21 (1687379)	21
Progress through FY 2010	0	0	0	0
Projections through 2015 *(consistent with FIMS and CEDR)*	39	15		

HPSB - Existing Buildings Summary - 15% of the GSF for facilities over 5000 sqft. (ref. CEDR worksheet 8. Existing Buildings HPSB)				
Fiscal Year	Guiding Principles		LEED	
	Number	GSF	Number	GSF
Prior FYs				
FY08				
FY09				
FY10				
FY11	1	296650	1	216000
FY12	5	113230		
FY13	5	613031		
FY14	5	281682		
FY15	5	382786		
Totals	21	1687379	1	216000

HPSB - Existing Buildings Summary - 15% Number of facilities over 5000 sqft. (ref. CEDR worksheet 8. Existing Buildings HPSB)				
Fiscal Year	Guiding Principles		LEED	
	Number	GSF	Number	GSF
Prior FYs				
FY08				
FY09				
FY10				
FY11	1	296650	1	216000
FY12	10	244101		
FY13	10	152725		
FY14	10	310878		
FY15	8	112550		
Totals	39	1116904	1	216000

2.4.2.1 Performance Status

A gap analysis was completed to identify systematic improvements necessary and to develop a plan to bring the identified HPSB buildings into compliance. The gap analysis determined that $52M is the approximate cost for a four-year project to bring the identified buildings into compliance including execution of the findings from the resource auditing and re-commissioning effort. This research also determined the funding necessary to perform required lighting audits, installing utility meters, re-commissioning, and a tenant awareness program. LANL is compliant with approximately 30 percent of the required HPSB actions, and funding has not been identified to reach the HPSB compliance goals.

2.4.2.2 Planned Actions

LANL will continue to identify and implement low-cost/no-cost guiding principles. In addition, LANL will implement Guiding Principles in order to become fully compliant with HPSB for one facility. In addition, Directorates with HPSBs or LEED-candidate facilities undergoing construction will implement actions within their EMS EAPs in support of HPSB or LEED project compliance. In addition, the Institution's EMS Environmental Action Plans (EAP) for FY 2011 will include HPSB elements. The directorates housed in the 19 existing buildings chosen for the HPSB program are being tasked to present their EAPs with measurable goals to address tenant education and green purchasing. In addition, the HPSB program will begin to integrate with the Long Range Development Plan and the current leasing agreements in order to reach the goal target.

Milestone	Deliverable	Due Date
Demonstrate through the use of EPA's Portfolio Manager, which facilities are anticipated to meet the Guiding Principles by FY2015	Portfolio Manager – screen shot with list of facilities within the program	March 2011
Increase implementation progress of the HPSB Guiding Principles for selected buildings	Status report showing percentage of Guiding Principles implemented for selected buildings	August 2011

2.5 Regional and Local Planning

The Laboratory is situated on Federally owned property located in Northern New Mexico within Los Alamos County and is currently operated by Los Alamos National Security (LANS) for the Department of Energy. The County was formed during World War II by the Federal government, as the site for Project Y of the Manhattan Project. Since that time, the laboratory has been transformed through real property transfers to tribal, federal, local governments and to private landowners, resulting in the current LANL site area of approximately 40 square miles, which comprises a significant portion of the 109 square miles which Los Alamos County now encompasses. The communities of Los Alamos and White Rock are governed by the County of Los Alamos. The Laboratory's neighbors include among others the tribal governments of San Ildefonso Pueblo, Santa Clara Pueblo, Jemez Pueblo, and Cochiti Pueblo. Other neighbors are Bandelier National Monument, administered by the U. S. Park Service; and the Santa Fe National Forest, administered by the U. S. Forest Service. Neighboring counties include Santa Fe, Sandoval, and Rio Arriba Counties.

The Laboratory sponsors and engages interactive and ongoing relationships with all neighbors to promote common goals and interest, as well as resolving cross jurisdictional issues. The Laboratory participates as positive partner in many community efforts and as a large stakeholder has the ability to bring diverse entities together in a common effort.

2.5.1 Performance Status

Los Alamos County and the Laboratory have a shared responsibility for many roads and utility systems. Nearly half the workforce in Los Alamos commutes from other counties. DOE maintains a number of agreements that allow the use of DOE right-of-ways/roads for public use. The DOE owns and maintains roads used by the public that come through the DOE property, East and West Jemez Roads, Diamond Drive, Camp May Road, and State Highway 4. The State Highway 4 is maintained by the State Highway Department where an easement exists between the DOE and the State of NM. East and West Jemez Roads and a small part of Diamond Drive and Camp May road are the responsibility of the DOE and therefore the Laboratory.

The Omega Bridge, along Diamond Drive, is a main thoroughfare between the County and Laboratory sites and is the responsibility of the DOE. The arched bridge spans more than 800 feet over the 200 foot deep Los Alamos Canyon. This 1950's bridge is important not only for commuters, but for emergency vehicles and utility pathways.

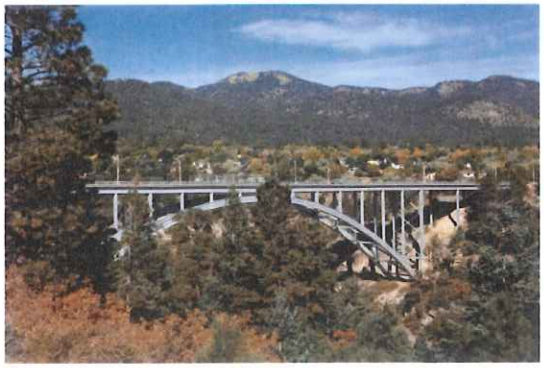


Figure 1: Omega Bridge

The Laboratory maintains and allows use of a central transit station facility within TA-3 on DOE property. This central station allows three transit systems to converge at this point: The Laboratory taxi and bus system, the County of Los Alamos's Atomic City Transit, and the State of New Mexico's Department of Transportation Park and Ride who contracts with All-Aboard America providing a regional bus service. The Los Alamos Atomic City transit provides transportation from the community of White Rock, at the southeast edge of the County, to the Los Alamos town-site, at the North end of the County, and within these communities.

Electrical distribution to Los Alamos County is managed by the Los Alamos Power Pool; established in 1985. It is the Los Alamos Power Pool operates under a cooperative arrangement between DOE and the County of Los Alamos. Terms set by the County and DOE in the Electric Energy and Power Coordination Agreement govern the management and operation of the Pool, and the cost of electricity delivered. This agreement expires June 30, 2020.

General transmission of power under the Los Alamos Power Pool comes from the San Juan Unit 4, El Vado Hydroelectric, Abiquiu Hydroelectric, Western Allocation, and Laramie River Station. A third hydroelectric unit has just been added to the Abiquiu Dam.[1] During the spring and summer months, up to 32% of the installed capacity can be provided from the hydroelectric plants. The Western allocation element of the Power Pool is typically the sole DOE contribution to the Power Pool, whose sources include three DOE gas-fired steam turbine generators and one combustion gas turbine generator. However these resources are normally only operated for emergency backup.

On-going Smart Grid efforts to improve distribution efficiencies in the system, involve the Los Alamos Power Pool as well as, DOE, Los Alamos National Laboratory and Los Alamos County. The goal of the Smart Grid collaboration is to improve Smart Grid technology by providing tools to forecast and respond to power supply needs created through consumer behaviors or provide other efficiency or reliability improvements.

In 2008, the DOE issued Order 430.2B requiring installation of on-site renewable energy sources. Previously, the Los Alamos County Utility Board directed the Los Alamos County Public Utilities to seek opportunities for "green" energy. Both these mandates worked towards the development of a renewable component in the Power Pool. The Power Pool agreement stipulates that both parties concur on the introduction of renewable energy into the power grid. A Renewable Energy Feasibility Study was completed jointly by LANL and Los Alamos County Public Utilities, in November of 2008. The report has resulted in the pursuit of a utility scale photovoltaic array, with a pending location at a capped land fill site, which Los Alamos County currently operates as a transfer station. The available site area could support a 2-3 megawatt capacity facility. The photovoltaic facility would be incorporated into the Smart Grid strategies. The Renewable Energy Feasibility Study indicated that up to 10 megawatts of photovoltaic power could be introduced into the system, allowing the potential for future additions of renewable resources.

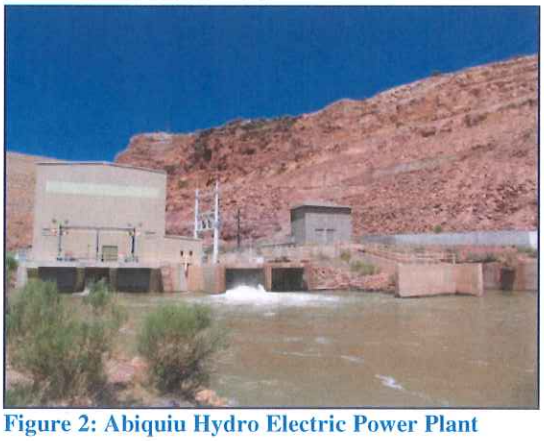


Figure 2: Abiquiu Hydro Electric Power Plant

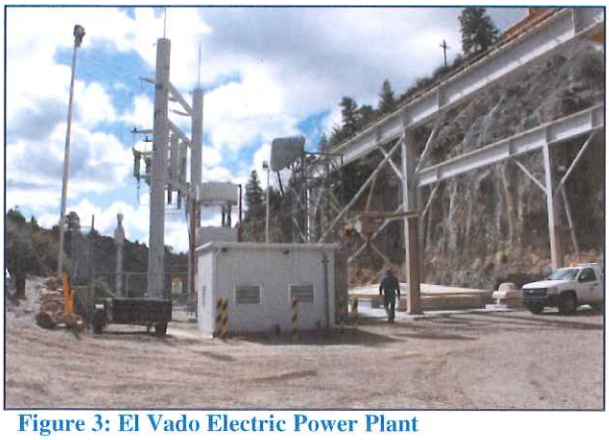


Figure 3: El Vado Electric Power Plant

[1] Renewable Energy Study, LA-UR 08-07230, "Los Alamos National Laboratory and Los Alamos County", 2008.

On the demand side, efforts have continued in reducing the overall building footprint of the Laboratory to help reduce the total energy intensity of the site. The American Reinvestment and Recovery Act has allowed for the reduction of 124,000 gsf of buildings, resulting in an estimated reduction of 28,000[i] MMBTUs per year after the program is completed. Facilities sold by the end of FY 2011 to the general public will reduce the intensity by about 1,100 MMBTUs per year; while facilities transferred to Los Alamos County, the Bureau of Indian Affairs, and the State of New Mexico have resulted in the reduction of about 1,100 MMBTUs also.

To balance the Laboratory's facility portfolio, about 430,000 gross square feet (gsf) of space is currently leased from private companies within Los Alamos County. Another 12,000 gsf is leased in the City of Carlsbad to support the WIPP project. These leased facilities are strategically located within the community to provide highly accessible space for general public access and also provide convenient access to public transit and are pedestrian friendly, enhancing eco-friendly transportation opportunities for the public as well as employees

In the area of current construction, the CMRR project includes a Radiological Laboratory, Utility, and Office Building (RLUOB) and a Nuclear Facility (NF) of more than 400k gsf. These defense program buildings are planned for LEED certifications. The RLUOB is seeking a silver certification and will be completed in FY 2011. The DOE recently awarded the Laboratory and Environmental Sustainability (EStar) award for integrating sustainable practices in the RLUOB design.

The NF is planned to be completed by FY 2022 with LEED certification. The 2003 EIS included methodologies to evaluate the capacities of onsite road and rail transportation networks, electric power and electrical load capacities, natural gas capacities, and water supply system capacities. If the capacities cannot be limited to on-site, the regional influence is expanded.

Four buildings have been built since FY 2003 that were built to LEED standards, but have not been certified. These buildings are the Defense Program's Nicholas C. Metropolis Center for Modeling and Simulation (otherwise known as the Strategic Computing Complex(SCC)), and National Security Sciences Building (NSSB); the Defense Nuclear Nonproliferation program's Nonproliferation and International Security Complex (NISC); and the Office of Science's Center for Integrated Nano Technologies (CINT). These buildings provided LANL an experience platform in sustainable design and construction at a time when the direction of "green building" practices was more unclear than it is today with the directions established in 430.2.B. Retro certification of these facilities under one of the appropriate LEED systems is currently being discussed.

Figure 3: Buildings NSSB, Metropolis Center, NISC

Laboratory and DOE interact frequently with County, State, Tribal and other Federal Agencies to affect positive working relationships on matters of common interest. DOE is in frequent interface with the local tribal governments in reference to Laboratory actions that may affect tribal lands or cultural resources. The Laboratory and DOE maintain agreements and interactions with other federal agencies and tribal governments in regards to the White Rock Canyon Reserve. The U.S. Park Service operates a wildfire fire station with helicopter flight access to fight regional wild fires from DOE property. DOE maintains an agreement to provide land for the County ECO Station for waste recycling and landfill operations.

DOE also maintains a number of utility easements with the County of Los Alamos; the Public Service Company of New Mexico (PNM); New Mexico Gas Company; and Qwest. DOE maintains several communications towers that provide communications for a number of government agencies including the security and emergency response service at LANL, the County of Los Alamos police, fire and emergency response, and others. The SBA Structures tower, located on DOE property, provides communications for a number of businesses.

2.5.2 Planned Actions

The DOE and the Laboratory participate in a pooling arrangement with Los Alamos County to provide electrical power to both the County and the Laboratory. The Pool is proceeding with installing a new 3MW hydroelectric unit at Abiquiu Dam, and pursuing the installation of up to 3MW of PV generation on a capped landfill on DOE property.

With the increase in computing power, laser programs, and the CMRR project, power demand is expected to increase and the transmission of power must be reconfigured and used more efficiently. The Central

Steam Plant Repowering and Distribution System Revitalization is a proposed project that will replace a 60 year old inefficient system. The new system will be more reliable and provide the electrical capacity needed for the future missions of the Laboratory and the Power Pool more efficiently. This system will provide up to 35MW of the annual electrical consumption of the Laboratory at a quarter the carbon emissions per kWH. It is expected to provide up to 35 MW of on-site generation and the free cooling economizer cycle will permit 4.5 MW of demand to be shed.

The proposed LANL Electrical Distribution Upgrade project will optimize utilization of available power. This upgrade will replace two 55 year old substations and will enable all the substations to provide shared load capacities for load growth around the Laboratory and the Power Pool. This project will increase the efficiency, reduce transformer no-load losses, and provide the means for installing Smart Grid technology and metering along with means to connect renewable energy resources. As a result, operation and maintenance costs, and production losses will be reduced. Continued planning for new federal facilities and leases will include the consideration of sites that are pedestrian friendly, near existing employment centers, and accessible to public transit unless the program requirements are specifically otherwise.

The NNSA posted a notice of intent to prepare a supplemental EIS for the CMRR-NF to assess the potential environmental impacts of the construction and operation of the nuclear facility due to the detailed site geotechnical investigations and the changes in the project. The Final EIS for the CMRR project (DOE/EIS-0350 the CMRR EIS) was issued in November 2003, and received a Record of Decision (69 FR 6967) February 2004. Coordination with the regional programs for federal, state, tribal, and local ecosystems, watershed and environmental management will continue as projects evolve.

2.6 Water Conservation Status

2.6.1 Water Efficiency

LANL's water reduction goals are to reduce the use of potable water by at least 16 percent by FY 2015, relative to the FY 2007 baseline. EO 13514 requires a 26% reduction in potable water by FY 2020 and a 20% reduction in Industrial, Landscaping, and Agricultural (ILA) water use by FY 2020 from a FY 2010 baseline.

2.6.1.1 Performance Status

In FY 2010, the LANL Generator Set Aside Funds (GSAF) program funded projects that contribute to water reduction goals. Specific projects include: Use of Biodiesel Co-product to Boost BOD at SWWS was initiated in FY 2010. Preliminary results indicate that it is possible to boost the Biological Oxygen Demand (BOD) at the LANL sanitary wastewater facility (SWWS) via crude glycerol, a by-product of biodiesel production. Long term implementation of this project may allow increased hydraulic throughput at the SWWS. Increased flows to the SWWS (hydraulic throughput) eventually end up at the planned expanded-SERF. Processing of sanitary effluent at the SERF will directly contribute to reductions in potable water consumption. The SWWS BOD project may allow increased flows to derive from routing cooling tower blowdown from permitted NPDES outfalls to the SWWS, and therein the SERF.

Significant effort was devoted to the NPDES ORP in 2009 and 2010. This program addresses the remaining NPDES permitted outfalls at LANL, currently discharging approximately 154 million gallons per year. The ORP is intended to assist with ensuring compliance with the EPA's NPDES permit for LANL, support increased efficiency and effective management of water, increase the use of "reclaimed water," and ensure compliance with DOE Order 430.2B. The ORP Integrated Project Team developed a plan for implementation of the program, which includes groups of projects designed to contribute to the

FY 2015 goals established in DOE Order 430.2B. Conceptual design and total project costs were validated based on the FY 2008 Project Execution Plans developed by the ORP Integrated Project Team.

2.6.1.2 Planned Actions

A conservative estimate of 24 percent water savings from FY 2007 (baseline year) is projected upon expansion and operation of the Sanitary Effluent Recycle Facility (SERF) as part of the National Pollutant Discharge Elimination System (NPDES) Outfall Reduction Program (ORP) by FY 2012. LANL used 412,070 kgal of potable water in FY 2010. During FY 2007 (baseline year), LANL used 336,500 kgal of potable water. The SERF project, in conjunction with additional water conservation efforts, including outreach and education, is projected to meet the water reduction goals. LANL demonstrated operation of the Sanitary Effluent Recycle Facility (SERF) plant and produced water that is useable in various hydronic systems across the LANL complex in the 1Q of FY 2010. LANL has received CD1 approval and expects to receive line item funds in FY 2011 to increase SERF capacity, with the intent of significantly reducing the use of potable water in cooling towers within the Supercomputing Complex (SCC) and Power Plant.

LANL will continue to monitor the ORP in order to anticipate compliant operation of SERF. The SERF expansion project will begin and operational plans include reclamation of at least 250,000 gallons of reuse water to begin the process of successful water management. In addition, LANL is planning to initiate a cost-benefit and water savings analysis related to integration of Cooling Tower (CT) and boiler operations within one team/organization and contract service for the CT chemical maintenance via a single vendor. Currently, CT operations are the responsibility of the FOD for the facility which is served by any given CT. In 2009, there were at least 4 different CT operational vendors providing treatment chemicals from at least 9 different CT chemical treatment manufacturers. Various CT chemical vendors offer differing levels of CT operational efficiency and particularly as it relates to the unique water chemistry coincidental with LANL and the Pajarito Plateau. Investigating the potential water savings from operating CT's with improved Cycles of Concentration (COC) is a significant opportunity for potential potable water savings. Improved COC's may be possible using state-of-the-art Silica inhibition or removal technologies offered by any given CT treatment chemical vendor.

Continue investigating the potential for increased hydraulic throughput at the SWWS via supplementation of the BOD and integrating the SWWS effluent into the currently configured, and future configuration, of the SERF.

Currently, without the implementation of SERF, water usage on site is inspected to continue to increase due to the use of cooling towers within data centers. However, LANL will implement a xeri-scape plan to phase out non-native grass species. It is unknown how much water will be saved by implementing this plan, but replacing non-native grass species with native landscape will further show LANL's commitment to water conservation. The FY 2010 baseline is for ILA water use is under development. Refer to the attached CEDR for more information on water conservation measures and the New Construction information, in Tab 7, to see how additional construction is expected to increase water use.

Milestone	Deliverable	Due Date
Xeri-scape Implementation Plan	North side of SM-40 and portions of LANSCE with new xeri-scape design and landscape work complete	August 2011
Operate SERF to reclaim at least 250K gallons of reuse water	Memo stating completion	August 2011

2.6.2 Storm Water Management

For any development or redevelopment project with a footprint that exceeds 5,000 square feet, use site planning, design, construction, and maintenance strategies to maintain or restore, to the maximum extent technically feasible, the predevelopment hydrology of the property with regard to the temperature, rate, volume, and duration of flow.

2.6.2.1 Performance Status:

All projects that exceeded 1 acre of soil disturbance, or that were part of a larger common plan of development that collectively exceeded 1 acre, were performed under coverage of the NPDES Construction General Permit (CGP). One requirement of the CGP is that permitted sites include interim and permanent stabilization, managerial, structural solids, erosion, and sediment control Best Management Practices (BMPs) to prevent to the maximum extent practicable an increase in the flow velocity from pre-construction, pre-development conditions. During FY 2010, 54 LANL projects were subject to the CGP, and therefore implemented the required storm water management. This was achieved through the identification of predevelopment hydrology values and incorporating into the project design and construction BMPs that included revegetation of disturbed areas, velocity control, and storm water detention structures with controlled outlet structures.

2.6.2.2 Planned Actions

Projects and activities that are subject to NPDES CGP coverage will continue to be identified in the preconstruction phase through existing LANL systems and procedures. This includes new facilities and infrastructure, D&D projects, and environmental restoration activities. During construction these projects and activities will implement CGP storm water management requirements, which for these projects, will also meet the storm water management goal identified in Section 2.6.2.

Milestone	Deliverable	Due Date
Achieve EPA's stormwater management objectives. Maintain or restore, for Federal properties over 5,000 sqft., the property's pre-development hydrology as to temperature, rate, volume, and duration of flow.	Status Report	August 2011

2.7 Pollution Prevention (P2)

2.7.1 Performance Status

LANL's P2 program continues to drive process improvements through implementation of its' third-party registered ISO 14001:2004 EMS, and the administration of the Generator Set Aside Fund (GSAF) which is used to reinvest funds collected from waste generating organizations into employee developed projects aimed at pollution prevention and/or compliance risk management. Goals associated with DOE's Strategic Sustainability Performance Plan (SSPP) are addressed by organizations at the Associate Director level (AD) having the largest control and/or influence over actions directly related to the particular goal through development of their annual environmental action plan (EAP). Projects funded by the GSAF program are also required to be tracked in the owning AD EAP.

Progress on specific actions related to the DOE SSPP are reported through the PPTRS and EMS reporting systems annually. Progress is being made on improving tracking and reporting on environmentally preferable purchasing performance data, and LANL expects these improvements to evident in the FY 2010 reporting cycle.

Current status by goal:
Minimizing the generation of waste and pollutants through source reduction
LANL is aggressively pursuing opportunities to accomplish source reductions, and success has been documented through the LANL P2 award program, and the DOE and NNSA P2 award programs. Documentation is also reported in the annual Hazardous Waste Minimization Plan provided to NMED in accordance with the facility RCRA Permit. LANL expects to continue to aggressively identify and pursue source reduction opportunities on a continual basis and report these successes annually.

Diverting at least 50 percent of non-hazardous solid waste, excluding construction and demolition debris, by the end of FY2015; diverting at least 50 percent of construction and demolition materials and debris by the end of FY2015; increasing diversion of compostable and organic material from the waste stream
LANL has a robust recycling program in place. LANL has a current diversion rate of 58%; this is a combination of regular office waste and construction and demolition waste. It is likely that the individual rates will be lower once reported per the SSPP, but plans to address this are being developed. No commercial composting services for food wastes are currently available in the Los Alamos area; brush and other organics are recycled at the local transfer station.

Reducing printing paper use and acquiring uncoated printing and writing paper containing at least 30 percent postconsumer fiber
LANL has met the goal of at least 30 percent recycled content paper use.

Reducing and minimizing the quantity of toxic and hazardous chemicals and materials acquired, used, or disposed of; increasing agency use of acceptable alternative chemicals and processes in keeping with the agency's procurement policies
Efforts to reduce the quantity of toxic and hazardous chemicals and materials have been ongoing and reported through PPTRS, and the annual Hazardous Waste Minimization Plan (NMED). These efforts are integrated with the institutional EMS objectives and targets, and a focus of the GSAF program. The amount of unused/unspent chemical waste has dropped significantly due to awareness and reuse efforts and, for the first time, unused and unspent chemicals are no longer the largest routine waste stream generated at the Laboratory. The Laboratory provides a link to generators to identify non-toxic alternatives for research and development projects.

Reporting in accordance with the requirements of Sections 301 through 313 of the Emergency Planning and Community Right-to-Know Act of 1986 (42 USC 11001 et seq.).
LANL currently meets the reporting requirements of this requirement and will continue to do so in the future.

"Verify the effectiveness and reliability of their clearance-of-property procedures to identify those materials that cannot be cleared for unrestricted reuse or recycling [initiated September 2011 to complete by September 2012]"
LANL has participated in a review of property clearance procedures and practices, as well as HS-22 sponsored workshops related to this topic. Actions are currently underway to identify gaps in implementation and to provide institutional guidance and requirements documents to address those gaps.

LANL expects those efforts to result in satisfying DOE's desire to improve the clearance process and increase the rate of reuse and/or recycling where appropriate.

2.7.2 Planned Actions

The FY11 P2 approach will focus on:

- integrating P2 principles into the project planning process;
- integrating P2 efforts and projects into the annual EMS planning cycle;
- improving alignment of institutional EMS objectives and targets with DOE SSPP goals;
- recycling and reusing materials;
- applying source reduction techniques to key targets as practicable, including GHG emitting chemicals;
- developing subcontractor P2 and waste minimization requirements through contract specifications;
- dedicating P2 and waste minimization resources to assist with large remedial actions;
- tracking, projecting, and analyzing waste data to improve waste management economies of scale; and
- communicating pollution prevention lessons learned to organizations.

Specific elements of the FY11 P2 work plan include:

Identify and pursue waste reduction opportunities.

1) Using the TRU Waste Roadmap (updated in FY10); working closely with TA-55 operations and support personnel to identify and prioritize TRU Waste reduction project opportunities;
2) Continue to support project efforts in reducing use of lead-lined gloves and related glovebox waste minimization efforts;
3) Support of TRU waste reduction efforts/initiatives in CMR through development and testing an automated Pu separation system.
4) Systematic assessment of non-hazardous solid waste streams (including organics and compostables), and development of a plan to attain a 50 percent diversion rate (minimum), excluding construction and demolition materials and debris, by the end of FY2015
5) Conduct an awareness campaign to reduce paper use and develop a plan to retire single-sided printers
6) Continue to provide guidance to generators on proper clearance and release of materials in compliance with the metals recycling suspension/moratorium.

Expanded implementation and use of dissolvable PPE and materials across the institution (LLW)

1) Establishment of an institutional BOA to enable organizations to increase purchasing of the dissolvable PPE;
2) Identify additional opportunities and/or organizations for expanded use of dissolvable PPE and materials.

Support expansion of the Green Is Clean (verification) program (LLW)

1) Initiate implementation of GIC within a facility or organization that had not previously participated in the program;
2) Continued support of developing and implementing property/materials clearance procedures.

Eliminate or reduce the acquisition, use, and disposal of toxic and hazardous chemicals and increase procurement and use of safer chemical or process alternatives

1) Continue to support expansion of the Chemical Re-use/Stockroom project across the institution (HW/Chem);
2) Increase awareness of the chemical alternative tool on the LANL P2 website to inform and encourage alternative (green) chemical usage;
3) Provide technical support for developing integrated pest management and appropriate landscape management practices.

Perform PPOAs on priority waste streams in support of organization's EMS action plans as they are identified (8 total).

1) Support systematic approach to evaluating priority waste streams, as identified by organizational EMS teams, to identify process improvement initiatives to eliminate or reduce waste generation.

Work with ASM to develop a sustainable acquisition plan.

1) Explore development of contractual requirements for subcontractor P2 performance;
2) Identify opportunities to improve subcontractor performance in waste minimization and pollution prevention activities.
3) Phased implementation of requirements for attaining 50 percent diversion rate for all construction and demolition materials/debris by FY2015;
4) Phased implementation of requirements for tracking and reporting on sustainable acquisition goals;
5) Reductions in acquisition, use, and disposal of toxic and hazardous chemicals (source reduction).

Administration and oversight of the Generator Set Aside Fund.

1) Evaluate proposals; allocate project funding; support project implementation throughout FY;
2) Communicate project successes and identify opportunities for expanded application of proven processes.

Communication

1) Alignment of institutional EMS Objectives with DOE Strategic Sustainability Performance Plan goals;
2) Institutional communications providing information and guidance on lessons learned and best practices associated with P2;
3) Identify high performing, successful projects with far-reaching applicability and develop award nominations at the local and national level.

Reporting in accordance with the requirements of Sections 301 through 313 of the Emergency Planning and Community Right-to-Know Act of 1986 (42 USC 11001 et seq.).

1) LANL currently meets the compliance reporting requirements of Sections 301 through 313 of the Emergency Planning and Community Right-to-Know Act of 1986 (42 USC 11001 et seq.) and will continue to do so in the future.

Milestone	Deliverable	Due Date
Maintain cost effective waste prevention and recycling programs. Minimize generation of waste and pollutants through source reduction. Divert 50% of non-hazardous solid waste from disposal by the end of FY2015. Divert 50% of construction and demolition materials and debris from disposal by the end of FY2015. Increase diversion of compostable and organic material from waste streams. Reduce and minimize the quantity of toxic and hazardous chemicals and materials acquired, used, and disposed by FY2015.	Quarterly Status Report	Quarterly

2.8 Sustainable Acquisition

2.8.1 Performance Status

The Acquisition Services Management Division-Assurance Operations (ASM-AO) group publishes a Designated Procurement Representative (DPR) Newsletter with periodic articles on Environmentally Preferable Products (EPP), procurement resources and DOE requirements; has created a green website as a consolidated resource for requesters to access up-to-date EPP information including Energy Star, FEMP and WaterSense certified products; and incorporated EPP concepts into the DPR trainings. Contract Administrators have included affirmative procurement clauses in an increasing number of subcontracts to support energy saving activities at the Laboratory and have been briefed on the latest DOE EPP requirements.

The Environmental Protection Division-Environmental Stewardship Group (ENV-ES) initiated an awareness campaign focusing on EPP, providing online tools to identify the EPP product numbers for frequently purchased items, and holding DPR briefings. DPR briefings also included information on other sustainable practices such as reuse, product alternatives identification, and minimization/elimination considerations.

Two virtual reuse centers were established that promote redistributing usable resources within the organization (non-barcoded property and chemicals). In addition, ENV-ES worked with the Engineering Standards Office to incorporated EPP requirements into the engineering specification documents. ENV-ES has also updated Exhibit F to include Sustainable Acquisition requirements.

LANL has reviewed existing contracts and started to develop a gap analysis for use in preparing a sustainable acquisition plan for 2011. This plan will address the goal of 95% of new contract actions meeting or exceeding the sustainable acquisition requirements.

2.8.2 Planned Actions

The FY 2011 EMS Institutional Objectives and Targets include sustainable acquisition and EPP language. ENV-ES will work with ASM to develop a Sustainable Acquisition Plan. ENV-ES will continue to provide awareness and outreach to LANL DPRs on sustainable acquisition and sustainable practices. In addition, ENV-ES will support directorates that own HPSBs to incorporate and implement actions within their EMS EAPs in support of sustainable acquisition requirements. ENV-ES will continue to work with

Engineering Standards to incorporate Environmentally Preferable Product (EPP) requirements in LANL engineering specifications and update Exhibit F to ensure that all Federally-mandated designated products and services are included in all relevant acquisitions.

Milestone	Deliverable	Due Date
ASM will provide a plan to improve EPP tracking information in categories required for the PPTRS report	ASM-AS sustainable acquisition data plan	March 2011
Continue to provide suggested EMS EAP (Environmental Action Plan) actions based on the guiding principles (GP) for HPSB	Distribute suggested actions to EMS Core team	April 2011
Develop Sustainable Acquisition Plan	Plan	May 2011
Update Exhibit F to ensure that all Federally-mandated designated products and services are included in all relevant acquisitions	Update Exhibit F	August 2011
Continue to provide targeted Sustainable Acquisition education to LANL DPRs	Complete two targeted briefings	August 2011
Educate DPRs in HPSB buildings on Sustainable Acquisition requirements	Complete DPR briefing in two HPSB buildings	August 2011
Continue to incorporate Sustainable Acquisition requirements in the LANL Engineering Specifications documents	Send most current Environmentally Preferable Product list and content level requirements to Engineering Standards	August 2011

2.9 Electronic Stewardship and Data Centers

2.9.1 Performance Status

Nicholas Metropolis Center for Modeling and Simulation (aka SCC)

Monitoring System – LANL installed a metering system to provide a baseline of the current state of the SCC before major infrastructure upgrades take place. LANL installed metering sensors on several pieces of electrical equipment including substations, distribution switchboards, and Rotary Uninterruptible Power Supplies (RUPS). These power metering devices will provide daily reports on total facility power usage, IT power consumption, humidity, and total mechanical power consumption.

Thermal Sensors – LANL installed wireless temperature sensors in the SCC to provide daily thermal profile of the entire 43,000 sq ft of computer floor space. The sensors will communicate with LANL's yellow network to send information on live temperature, humidity, and air flow readings to software that can be accessed from any computer on the network. This allows the Laboratory to measure the temperature of the computer platforms to ensure they are getting enough cooling/air flow. It will provide real time data, history, and alarm trending of the data center.

PUE – Calculated the Power Usage Effectiveness (PUE) at the SCC. The monitoring system in place at the SCC will allow the Laboratory to automatically generate the PUE. Refer to the attached CEDR - Data Centers Tab 9 - for PUE calculations.

Laboratory Data Communications Center (LDCC)
Replace Chillers – In FY 2010, LANL replaced three out of four chillers in the LDCC and the fourth one will be replaced in FY11. The aging, 700 ton chillers are 21 years old and are being replaced with new 800 ton chillers that are much more efficient.

Test & Balance – An outside vendor has taken field measurements of each of the computer rooms to help identify how much water and energy are being used. This will provide a maximum capacity load for each computer room in anticipation of liquid cooling.

PUE – A monitoring system, similar to the one at the SCC, will be installed so that the Laboratory can more accurately calculate the LDCC PUE. LANL will install electrical metering devices on all substations and associated power distribution units to determine the PUE.

2.9.2 Planned Actions

Most of the milestones that are identified in this Plan will be funded by the Nuclear Weapons (ASC) Program.

Nicholas Metropolis Center for Modeling and Simulation (aka SCC)
Infrastructure Efficiencies – LANL will partner with an outside vendor to provide a conceptual study to identify infrastructure improvements in support of an eventual exa-scale computer at the SCC. Computation at the exa-scale level present new engineering challenges in facility design due to the very high computer equipment densities, power, and cooling technology challenges. The vendor will provide more efficient methods for keeping up with power and cooling demands while maintaining reliability.

Power Factor Study – An outside vendor will perform a study to determine why the power factor of the electrical system at the SCC is low compared to the two other facilities. This study will help the Laboratory determine where and why the power factor is low and what is needed to do to correct it.

Laboratory Data Communications Center (LDCC)

Metering Devices – LANL will install flow and temperature sensors on all Computer Room Air Conditioners (CRACs), which will allow the Laboratory to monitor CRAC units plus acquire metering for the PUE calculation. These sensors will be monitored through the Trane Building Automation System.

Streamline raised-floor cooling – As systems are decommissioned, LANL will continue to remove unused cabling from under the raised floor and seal floor tile cuts to prevent cold air from escaping. This will help improve airflow and efficiency of the cold air delivery systems.

Virtualization – LANL will continue to centralize server farms in one location in an effort to reduce energy. This allows the Laboratory to consolidate physical resources and reduce power and cooling requirements. Two rooms in the LDCC have been identified for this effort—rooms 105 and 205F.

VFDs – Variable Frequency Drives will be installed for the cooling towers which will help improve efficiency and reliability over manual control motor starters.

Milestone	Deliverable	Due Date
Partner with an outside vendor to provide a conceptual study to identify infrastructure improvements in support of an eventual exa-scale computer at the SCC	Potential infrastructure improvements	August 2011
Perform a study to determine why the power factor of our electrical system at the SCC is low compared to our two other facilities	Study details and improvement plan	August 2011
Install flow and temperature sensors on all Computer Room Air Conditioners (CRACs)	Installation evidence	August 2011
Continue to remove unused cabling from under the raised floor and seal floor tile cuts to prevent cold air from escaping	Ongoing	August 2011
Continue to centralize server farms in one location in an effort to reduce energy	Ongoing	August 2011
Variable Frequency Drives will be installed for the cooling towers which will help improve efficiency and reliability over manual control motor starters	Installation evidence	August 2011

2.10 Site Innovation

The cross-function sustainability planning efforts engage Laboratory scientists and engineers in the program planning and to address specific challenges for the Laboratory to meet the sustainability targets and goals. Over the past two years the Laboratory established a Stimulus Office that brought together several operations and research organizations to jointly work on sustainability issues in response to stimulus funded proposal requests. These multidisciplinary teams worked to develop innovative solutions that could be replicated elsewhere across the complex and in other communities to address sustainability and energy management challenges. The Laboratory was part of many teams awarded research activities that significantly expanded the research portfolio in many areas related to energy and sustainability.

Following the stimulus efforts, LANL has continued to develop several sustainability projects combining a broad suite of resources at the Laboratory. Examples of these projects in FY10 and FY11 include: EERE funded fuel cell feasibility study, OE funded demand response demonstration, Steam Plant Replacement project conceptual development, high temperature superconductivity to power supercomputing, and a Los Alamos County landfill PV development and smart grid demonstration project with international partners. Each of these projects engage a diverse cross section of scientists, engineers, and operations staff to specifically address sustainability goals and targets for the Laboratory using creative, innovative and cost-effective approaches. We are using the Laboratory's operational needs in tandem with our research interests to drive novel solutions and believe that there will be many opportunities to increase the collaboration between research and operations as we move forward.

In conjunction with the collaborative efforts on projects, the Laboratory has been engaged with the National Laboratory Directors' Council (NLDC) to dialogue with other sites to share our efforts and the approaches being taken to meet the sustainability goals. LANL will continue to participate and fully support the NLDC efforts in this area. LANL has also recently begun to interact directly with the NNSA Laboratories at Sandia and Livermore to plot a path whereby these laboratories can effectively and

efficiently work together to increase progress toward the sustainability goals. We held our first joint planning meeting with Sandia in September and are expanding that participation to include Livermore at the end of October.

LANL's initial efforts in sustainability were driven from the operations and environmental compliance perspective but have broadened as the process has matured to include many cross-functional efforts. Currently the Laboratory is extending sustainability planning into its campus redevelopment efforts and the planning efforts for future programmatic mission including exa-scale supercomputing and enhanced accelerator operations at LANSCE. These broad planning efforts will help ensure that future development activities are planned in a way that supports the Laboratory's contributions toward the Department's sustainability goals and targets.

3 Return on Investment

LANL will begin to include sustainability factors into the Infrastructure and Site Planning Projects planning matrix. This will include a return on investment process and how climate change risks and vulnerability will factor into project prioritization to ensure the Laboratory is meeting its sustainability goals while generating the greatest cost savings for DOE as it executes its mission.

3.1 Performance Status

Currently, the Laboratory does not have a defined approach or a strategic plan to leverage alternative financing for meeting sustainability goals, measuring savings, or verifying performance. In addition, LANL has not defined how savings will be reinvested to further future conservation efforts. Refer to the attached CEDR, Tab 5 for current project ROI details.

3.2 Planned Actions

LANL realizes the social and environmental benefits of GHG reduction and long term sustainability.

Action	Deliverable	Due Date
Define program to measure savings, verify performance, and reinvest savings	Reinvestment Program details	August 2011
Define approach/strategic plan to leverage alternative financing for meeting sustainability goals	Finance Plan – or 2020 matrix for meeting sustainability goals	September 2011
Implement program that measures savings, verifies performance, and reinvests savings	Program description	October 2011

4 References

DOE (U.S. Department of Energy), 1995, *Dual Axis Radiographic Hydrodynamic Test Facility Final Environmental Impact Statement*, DOE/EIS-0228, Albuquerque Operations Office, Los Alamos Area Office, Albuquerque, New Mexico, August.

DOE (U.S. Department of Energy), 1998, *Environmental Assessment for the Proposed Strategic Computing Complex, Los Alamos National Laboratory, Los Alamos, New Mexico,* DOE/EA-1250, Los Alamos Area Office, Los Alamos, New Mexico, December.

DOE (U.S. Department of Energy), 1999, *Site-Wide Environmental Impact Statement for Continued Operation of the Los Alamos National Laboratory, Los Alamos, New Mexico*, DOE/EIS-0238, Albuquerque Operations Office, Albuquerque, New Mexico, January.

DOE (U.S. Department of Energy)/National Nuclear Security Administration (NNSA), 2008, *Site-Wide Environmental Impact Statement for Continued Operation of Los Alamos National Laboratory, Los Alamos, New Mexico*, DOE/EIS-0380, Los Alamos Site Office, Los Alamos, New Mexico, May.

DOE (U.S. Department of Energy), 1999, *Final Environmental Impact Statement for the Conveyance and Transfer of Certain Land Tracts Administered by the U.S. Department of Energy and Located at Los Alamos National Laboratory, Los Alamos and Santa Fe Counties, New Mexico,* DOE/EIS-0293, Los Alamos Area Office, Los Alamos, New Mexico, October.

DOE (U.S. Department of Energy) Order 450.1: Environmental Protection Program, January 15, 2003. Document can be found through search at http://www.directives.doe.gov

DOE (U.S. Department of Energy) Order 430.2B:_Departmental Energy, Renewable Energy and Transportation Management, February 27, 2008. Document can be found through search at http://www.directives.doe.gov

DOE (U.S. Department of Energy) Strategic Sustainability Performance Plan, August 3, 2010. Document can be found through search at http://www.energy.gov/media/DOE_Sustainability_Plan_2010.PDF.

Executive Order 13423 Strengthening Federal Environmental, Energy, and Transportation Management, January 24, 2007. http://ofee.gov/eo/EO_13423.pdf

Executive Order 13514 Federal Leadership in Environmental, Energy, and Economic Performance, October 8, 2009. http://edocket.access.gpo.gov/2009/pdf/E9-24518.pdf

LANL (Los Alamos National Laboratory), 2008, *Renewable Energy Feasibility Study*, LA-UR-09-07 230, Los Alamos National Laboratory, Los Alamos, New Mexico. November 2008.

Public Law 109-58, Energy Policy Act of 2005, August 8, 2005. Document can be found through search at http://thomas.loc.gov

United States Congress, *Energy Independence and Security Act of 2007,* 2007, Washington, D.C.

5 Attachments

1) CEDR
2) EMS4 energy report
3) FIMS final list of buildings with excluded buildings, as well as a copy of the exclusions self certification form is also attached.
4) Draft FY 2011 Metering Plan